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BY

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WITH NUMEROUS MAPS AND MANY ILLUSTRATIONS, CHIEFLY PHOTOGRAPHS OF ACTUAL SCENES

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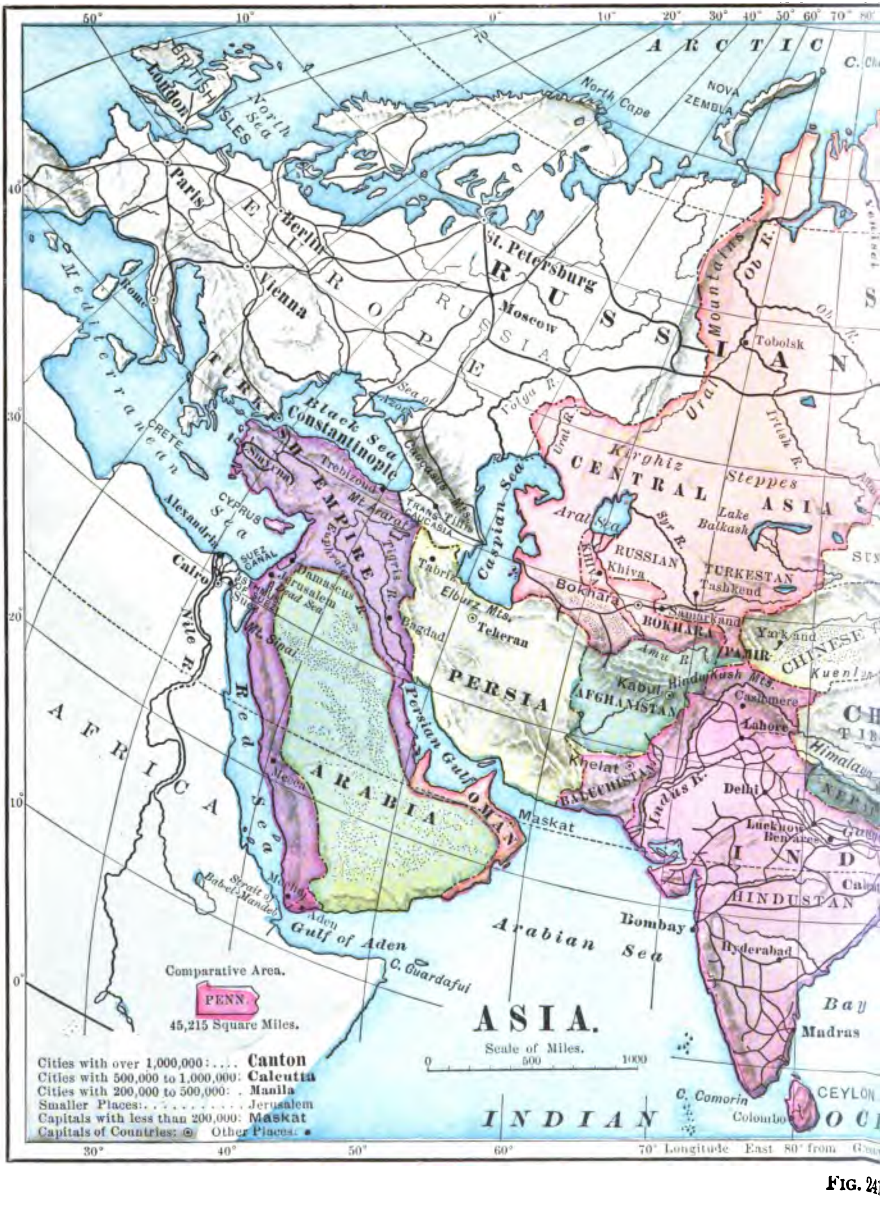
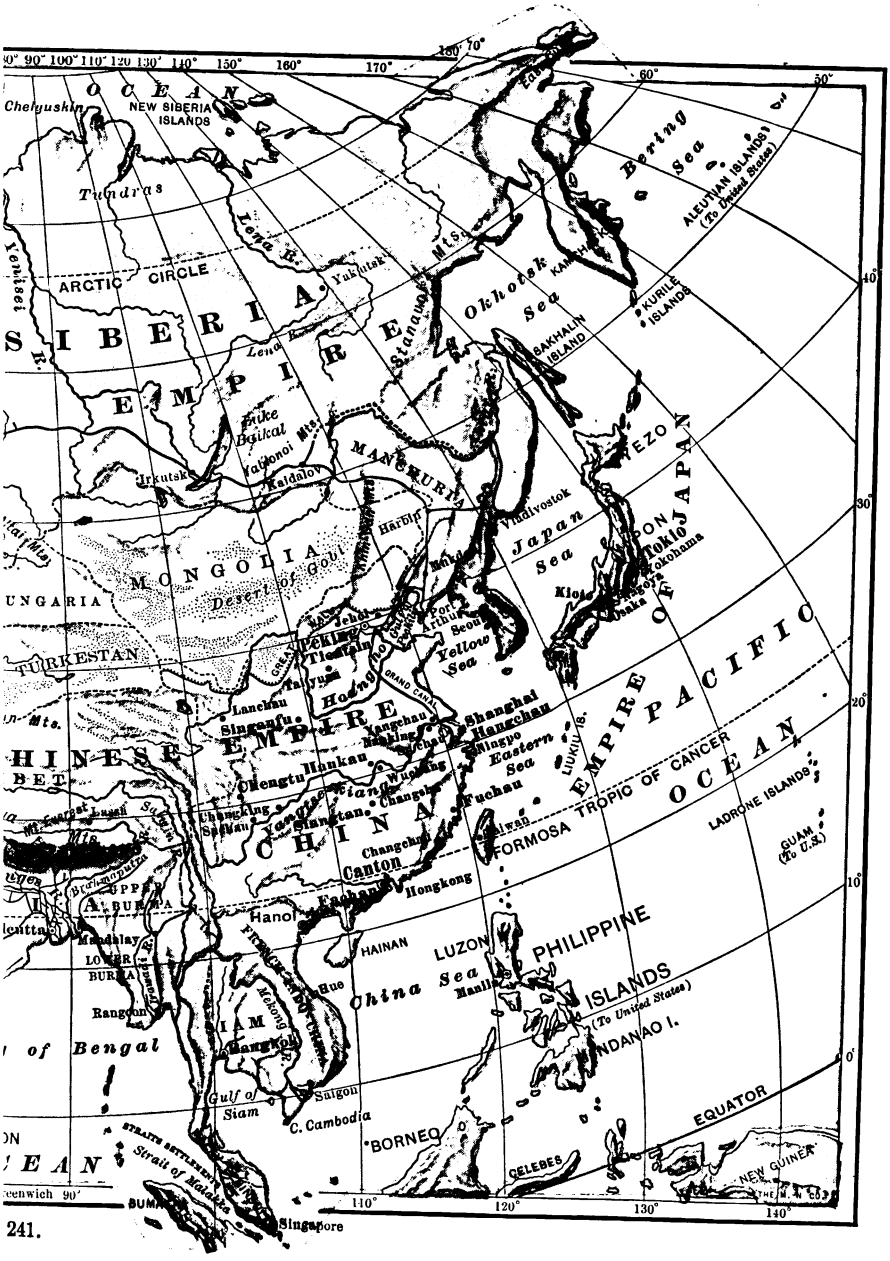

ASIA.
Scale of Miles.
0 500 1000
Comparative Area.
PENN.
45,215 Square Miles.
Cities with over 1,000,000: .... Canton
Cities with 500,000 to 1,000,000: Calcutta
Cities with 200,000 to 500,000: . Manila
Smaller Places: . . . . Jerusalem
Capitals with less than 200,000: Maskat
Capitals of Countries: ⊙ Other Places: •
A R C T I C
North Cape
NOVA ZEMBLA
BRITISH ISLES
London
North Sea
Paris
Berlin
Vienna
Rome
E U R O P E
St. Petersburg
Moscow
R U S S I A N
RUSSIA
Tobolsk
Ural Mountains
Ob R.
Mediterranean Sea
CRETE
CYPRUS
Alexandria
Cairo
SUEZ CANAL
Nile R.
A F R I C A
TURKISH EMPIRE
Black Sea
Constantinople
Sea of Azof
Smyrna
Trebizond
Mt. Ararat
Caucasus Mts.
TRANS CAUCASIA
Tiflis
Caspian Sea
Volga R.
Ural R.
Irtish R.
Kirghiz Steppes
CENTRAL ASIA
Aral Sea
Syr R.
Lake Balkash
RUSSIAN TURKESTAN
Khiva
Tashkend
Bokhara
Samarkand
BOKHARA
Euphrates
Tigris R.
Damascus
Jerusalem
Dead Sea
Suez
Mt. Sinai
Bagdad
Tabriz
Elburz Mts.
Teheran
PERSIA
Persian Gulf
Amu R.
PAMIR
Yarkand
CHINESE
Kuenlun
Kabul
Hindu Kush Mts.
AFGHANISTAN
Cashmere
Lahore
Himalaya
Khelat
BALUCHISTAN
Indus R.
Delhi
Lucknow
Benares
I N D
Calcutta
HINDUSTAN
Red Sea
Mecca
ARABIA
OMAN
Maskat
Mocha
Strait of Bab-el-Mandeb
Aden
Gulf of Aden
C. Guardafui
Arabian Sea
Bombay
Hyderabad
Bay
Madras
C. Comorin
CEYLON
Colombo
INDIAN
30° 40° 50° 60° 70° Longitude East 80° from

FIG. 24



OCEAN
Chelyuskin
NEW SIBERIA ISLANDS
Tundras
Lena R.
ARCTIC CIRCLE
Yenisei R.
SIBERIA
EMPIRE
Yakutsk
Lena R.
Stanovoi Mts.
Okhotsk Sea
KAMCHATKA
Bering Sea
ALEUTIAN ISLANDS (To United States)
KURILE ISLANDS
SAKHALIN ISLAND
Lake Baikal
Yablonoi Mts.
Irkutsk
Kaidalov
MANCHURIA
Harbin
Vladivostok
Japan Sea
YEZO
JAPAN
Tokio
Yokohama
Kioto
Osaka
MONGOLIA
Desert of Gobi
UNGARIA
TURKESTAN
Peking
Tientsin
Tanyun
Hoang Ho
Port Arthur
Seoul
Yellow Sea
GRAND CANAL
Lanchau
Singanfu
EMPIRE
Shanghai
Hangchau
Ningpo
Eastern Sea
LIUKIU IS.
EMPIRE OF JAPAN
PACIFIC OCEAN
Chengtu
Hankau
Wuchang
Changsha
Fuchau
Yangtse Kiang
Changking
Sachau
Shangtan
CHINA
Changchau
Canton
Hongkong
Fachau
FORMOSA
TROPIC OF CANCER
LADRONE ISLANDS
GUAM (To U.S.)
Hanoi
HAINAN
LUZON
PHILIPPINE ISLANDS (To United States)
Manila
China Sea
Hue
Mekong R.
SIAM
Bangkok
Saigon
Gulf of Siam
C. Cambodia
BORNEO
CELEBES
EQUATOR
NEW GUINEA
Mandalay
LOWER BURMA
Rangoon
of Bengal
Strait of Malakka
Singapore
Greenwich 90°

241.

PART IV

ASIA, AFRICA, AUSTRALIA AND ISLAND GROUPS

XXI. ASIA

MAP QUESTIONS (Fig. 241). (1) Compare the greatest length and breadth of Asia with that of North America (Fig. 434). (2) Compare its area with that of other continents. (*For Areas, see Appendix II.*) (3) Where are the mountains; (4) the plains? (5) Draw an outline map of Asia, adding the names and boundaries of the countries. (6) Find four large inland seas and lakes. Which have no outlets? (7) Find the area of China, India, and Siberia. About how many times as large as Pennsylvania is each? (8) What facts concerning the climate do you infer from the map? (9) What does the general absence of railways (Fig. 241) tell about the development of the people? In what part has there probably been most progress? (10) Name some of the large islands near Asia. Name some of the largest islands between Asia and Australia (Fig. 338).

Size and Position. — Asia, the largest of the continents, includes almost one-third of the land of the globe. Its immense size is shown by the fact that it reaches from near the equator to a point halfway between the Arctic Circle and the North Pole. How many degrees is that? How many miles? It is six thousand miles from the Mediterranean Sea to Bering Straits; and so many degrees of longitude are included in Asia that, according to our plan for standard time, one would need to change his

watch ten different times in going from one extreme to the other. How many changes are necessary in crossing the United States? (Fig. 22).

This great land mass, which reaches to within fifty miles of North America, is united to Africa by the Isthmus of Suez,

FIG. 242.
The volcano of Fujiyama in Japan.

while for a long distance the two continents are separated only by the narrow Red Sea. What is its connection with Europe? Why are the two often called Eurasia? (p. 149). In what zones does Asia lie? Is the same true of any other continent?

Physiography (Fig. 243). Asia resembles Europe in the irregularity of its mountains. While many of them

TROPIC OF CANCER
RELIEF MAP
OF
EURASIA
Plotted by
EDWIN E. HOWELL
SCALES

FIG.

. 243.

extend east and west, there are otners running nearly north and south. Name some of each. The islands and peninsulas are due to uplift of the earth's crust, while the seas which they enclose occupy depressions between the uplifted parts. Since the mountain growth has not entirely ceased, many of the islands are still slowly rising; and, as the rocks move and break, earthquake shocks are common, some of them being terribly destructive. There

FIG. 244.
The gorge of the Yangtse-kiang in China.

are also many volcanoes (Fig. 242); in fact, the islands off eastern and southeastern Asia form the most active volcanic and earthquake region in the world.

Although northern and western Asia is a vast plain, so much of the continent is mountainous that more than one-twelfth of the surface has an elevation above 10,000 feet. Here are found the Himalayas (meaning abode of snow), whose loftiest peak, Mt. Everest (29,000 feet), is the highest in the world. Locate it. And here, too, are other ranges whose peaks rise above

valleys themselves 11,000 feet above sea level, or higher than most mountains. Between the mountains are table-lands, like that of Tibet (Fig. 245), whose elevation is from 10,000 to 15,000 feet, or in places as high as the loftiest peaks of the Alps.

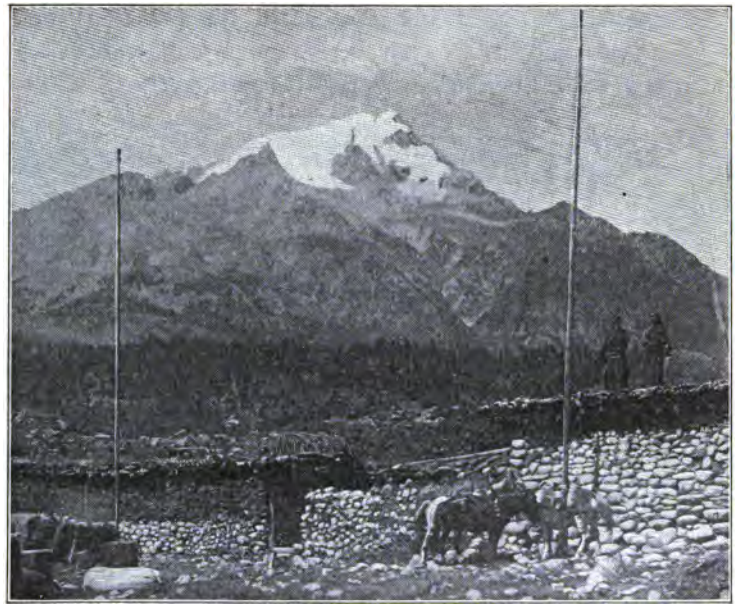


FIG. 245.
A farm-house in bleak Tibet, with a snow-capped mountain in the distance.

Much of central Asia is so arid that some of the rivers from the mountains end in the desert sands, which are often heaped by the wind into low hills or dunes. But from the margin of the great central highland large rivers flow north, south, and east to the sea. On an outline map of Asia draw heavy lines to show the chief mountain chains, and then add the larger rivers with their names.

Fed by the rains, snows, and melting glaciers of the mountains, these streams have a great volume of water and bear immense quantities of sediment, which they spread out over their broad flood plains or build into deltas in the sea. In the east and south these fertile, river-made plains are valuable for agriculture, and are the seats of the densest populations in the whole world.

FIG. 246.
A tropical scene in a village in Ceylon.

Many of the rivers are deep and navigable (Fig. 244); yet some of the largest lose much of their value for transportation because they flow northward over the cold plains of Siberia. This reminds us of the rivers of northern Canada, which also flow into the Arctic and are therefore frozen during a large part of the year.

A great variety of mineral wealth is revealed by the weathering of the upturned mountain rocks. Precious stones, including diamonds, sapphires, and rubies; the precious metals, gold, silver, and platinum; the baser metals, such as iron, copper

and lead; and vast coal beds are all found in various parts of Asia. But, because of the peculiar character of the people, the great mineral wealth has been only slightly developed.

Climate. — In so vast a land, with such differences in elevation, there are, naturally, many different climates. Tropical heat is found in southern Asia, with dense forests in the belt of calms (Fig. 246), and in those places where ocean winds blow over the land; but where winds

FIG. 247.

A group of Persian natives on the desert of eastern Asia.

from the ocean cannot reach, there are broad deserts (Fig. 247). Upon the mountain slopes (Fig. 245), and in the more northern latitudes, the climate is either temperate or frigid, as in North America and Europe.

For example, the climate about Peking resembles that of northeastern United States; and the plains of central Siberia resemble in climate the plains of Minnesota and Dakota, and produce the same crops. Such a climate, with warm summers and very cold winters, is called *continental;* and since Asia is the largest continent, the continental climate is best developed there. Thus where the Arctic Circle crosses the Lena River,

the average temperature is 60° in July and 60° below zero in January, a range of 120° between summer and winter. This is the lowest winter temperature known in the world, and this point is therefore called the *cold pole* of the earth.

During the winter, when such a cold blanket of air covers the interior of Asia, the wind blows outward toward the warmer ocean, producing the winter monsoon (pp. 34–37). Accordingly, throughout most of Asia the winter rainfall is light. Why? But in summer, when ocean winds blow toward the warm land, there is abundant rain near the coast, especially where the damp summer monsoons rise over the mountains, as in India (Fig. 33).

As in northwestern United States, where the Cascade Ranges drain the prevailing westerlies of their moisture, the mountains of Asia cause the summer monsoons to reach the interior with little vapor. It is for this reason that a large part of the interior of Asia is arid, and often such a complete desert that it is shunned by all living things. That this arid country is growing even more arid, is indicated by the fact that the Aral and Caspian seas are surrounded by salt plains formerly covered with shallow water. During the last century the Caspian has grown decidedly smaller, having lost fully seven thousand square miles of its area through evaporation.

Plants and Animals. — The cold northern part of Siberia, like northern Europe and America, is tundra. Describe it (p. 63). Toward the south the tundra grades into the forest, low, stunted trees being followed by true forests of evergreens, birches, poplars, etc. Farther south, where the rainfall is light and the evaporation rapid because of the higher temperature, the soil is so dry in summer that the forests disappear. These steppes are covered with luxuriant grass in the north, but farther south they grade into the desert. Since northern Asia is really a continuation of Europe, the wild plants and animals, as well as the farm products, resemble those

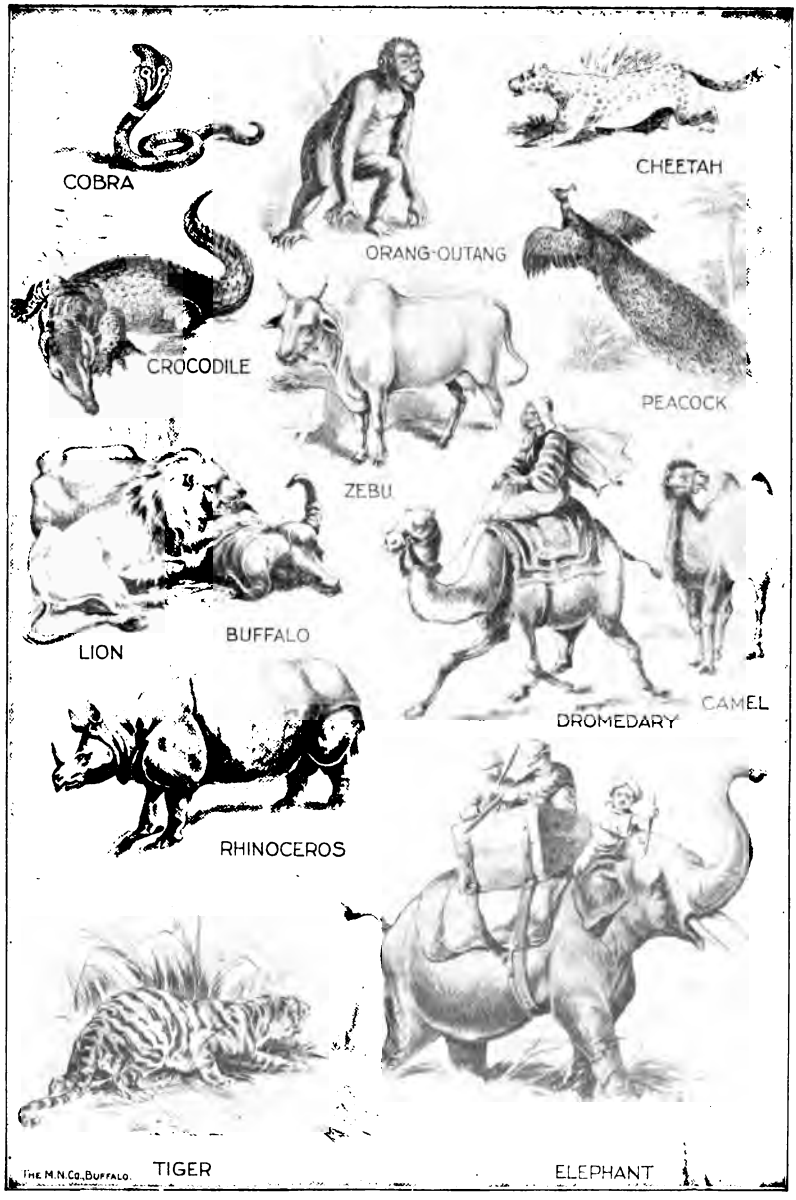


FIG. 248.

Some of the animals of Asia.

of Europe. Name some of the European farm products.

In southern Asia, on the other hand, from Arabia to China, the plants and animals resemble those of Africa rather than those of Europe and northern Asia (p. 68). One reason for this is that southern Asia has a tropical climate like Africa; another is that a mountain and desert barrier separates northern from southern Asia. Trace this barrier on Figure 243. As in Africa, the arid portion, including Arabia, Persia, and central Asia, is the home of the camel (Fig. 248) and ostrich (Fig. 300), while the elephant and rhinoceros (Fig. 248) live on the savannas and in the tropical jungles. Southern Asia is also the home of the fierce tiger and numerous species of monkeys and apes (Fig. 248).

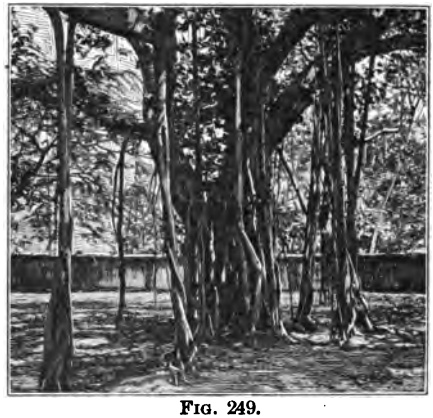


FIG. 249.
The banyan, or Indian fig tree, from whose lower branches shoots descend and take root — common in Ceylon and other parts of southern Asia.

It was in Asia, probably the seat of the oldest civilization of mankind, that men first learned to make use of some of the animals and plants that are now so valuable in all parts of the world. No one knows what race first domesticated the horse, dog, sheep, and several other animals, nor who first cultivated wheat and many other plants; but long before Europe was civilized the people of Asia knew their value. At the time of

Herodotus (about 484–420 B.C.) the people of India grew cotton and wove it into cloth; and they kept sheep horses, cattle, and goats. Tea and oranges were introduced into Europe from China, and the lemon tree came from India.

The extent to which the Asiatic people have employed animals in their service is indicated by the following facts. On the frozen tundras, where none of the other large domesticated animals thrive, the reindeer (Fig. 48) not only supplies milk, meat, and hides, but is also used as a work animal. The camel, whose original home seems to have been Asia, makes human habitation possible in the desert (Figs. 248, 265, and 283).

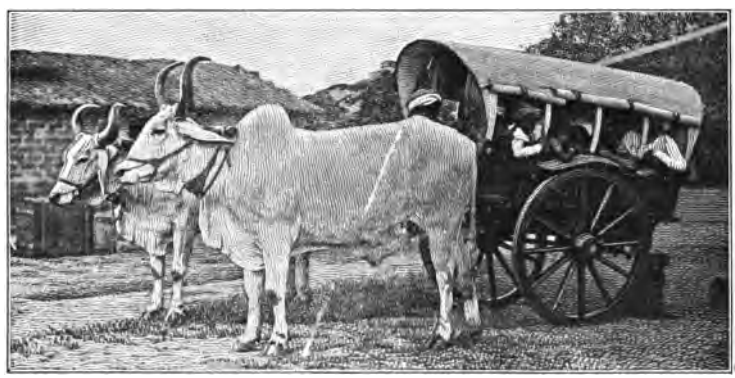


FIG. 250.

Native humped cattle used as draught-animals in Burma.

Elephants are domesticated and made to work in the dense tropical forest (Figs. 251 and 277); and the buffalo is used as a work animal in hot, damp lands where horses find the climate trying (Figs. 250 and 274). Among the lofty plateaus and mountains, where the air is so rarefied and the slopes so steep that other work animals cannot be used, the yak is domesticated. Upon the steppes, where herds of cattle, sheep, and goats are kept, the horse is so necessary to the herder that the men almost live in the saddle. Indeed, the word *Cossack*, applied to Russians who dwell on the steppes, means horseman.

People. — Early progress toward civilization was made possible in Asia largely because certain portions were so favorably situated. The flood plains of the Euphrates and of the Indian and Chinese rivers had a fertile soil and an abundance of water for irrigation. They were, moreover, protected from invasion by ocean, desert, and mountain barriers, and the inhabitants could therefore cultivate the arts of peace. Among the shut-in valleys of the lofty mountains, also, were centres where development was possible because so protected from wandering hordes.

FIG. 251.
An elephant in Ceylon drawing a cart loaded with cocoanuts.

Asiatic peoples, moving into Europe, carried the civilization of their old home with them, and in time advanced much beyond those whom they left behind. In fact, while Europeans have been progressing the Asiatics have been standing still, and in some cases even falling back.

It would be difficult to give all the reasons for this last fact, but there are three that are prominent. One is the very isolation which made the first development possible; for the people were so cut off and separated geographically that they failed to learn from others, as those Europeans who dwelt along the Mediterranean were able to do. A second reason is that

many Asiatics, like, for example, the Chinese, have felt that their civilization was the best, and have therefore refused to learn. A third reason is found in the wonderful development of navigation by Europeans who have thereby learned many useful lessons from all parts of the world, acquired wealth, and founded distant colonies. The sea, formerly a protection to many Asiatic people, has, in recent times, even been used as a highway of attack upon them.

Where European civilization has been adopted, as in Japan and parts of India, rapid progress has followed. This indicates the possibilities of these people.

FIG. 252.

Chinese women. Notice the feet of the one on the right. It is a custom of the Chinese to prevent the feet of women from growing.

More than half of the human race lives in Asia, two-thirds of them belonging to the yellow division (p. 73) while the remainder are mainly whites. But although there are more than eight hundred million human beings there, most of the continent is sparsely settled. The mountain slopes, the cold plateaus, the steppes, deserts, forests, and tundras support but few inhabitants (Fig. 253). In these places, hunting, fishing, and herding are the leading industries. Nearly seven-eighths of the people dwell near the coast, especially on the river flood plains and deltas of the south and east. There almost every foot of available land is cultivated, and soil is even transferred to boats on the rivers.

There is a wide difference between the religious beliefs of the Europeans and Asiatics (pp. 93–95). Christianity has spread westward along the shores of the Mediterranean, but it has made little progress across the desert and mountainous land to the east, where earlier religions had a strong foothold. Two-thirds of the Asiatics are Brahmins or Buddhists, as were

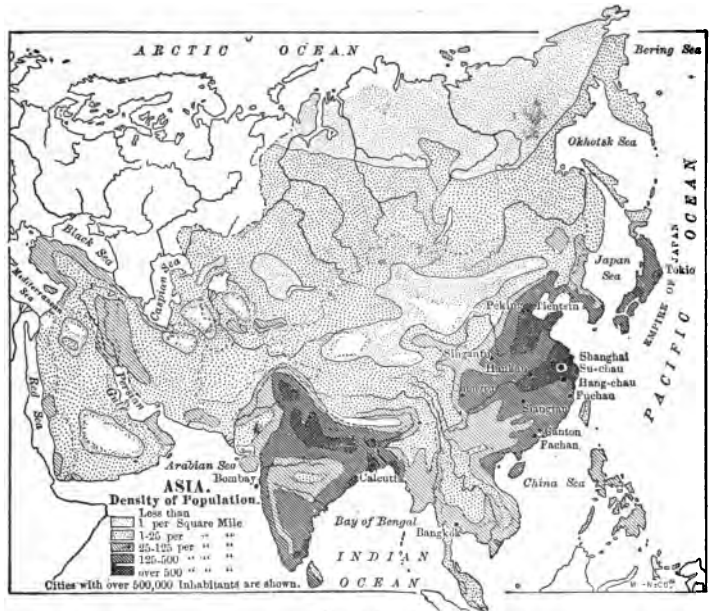


FIG. 253.

their ancestors (Fig. 254). Many others are of the Mohammedan faith, which originated in Asia long after Christ, and has not only replaced the Jewish and Christian religions in most of western Asia, where they started, but has even spread eastward.

Turkish or Ottoman Empire. — While Constantinople, the capital of the Turkish Empire, is in Europe, Turkey has ten times as much land in Asia as in Europe.

Conditions in the Empire.—Turkey in Asia, although of little importance among nations at the present time, is of peculiar interest to us because of its historical associations. It is within its territory that many of the places mentioned in the Bible are located (Fig. 259); here also Christ was born, as well as the prophet Mohammed; and it was from this centre that much of the ancient civilization spread along the shores of the Mediterranean.

FIG. 254.
Worshipping at a Shinto temple in Japan.

Much of Turkey in Asia is table-land, with short mountain ranges and extinct volcanoes, of which Mt. Ararat is an example. Excepting along the coast of the Mediterranean and Black seas, where the wind brings vapor, there is little rainfall. The streams are usually short and shallow, and there are numerous salt lakes. Point out the two principal rivers (Fig. 241).

Some of the mountain slopes are forested, but elsewhere the country is open, and in places suited to herding and agriculture. In the valleys, wheat, grapes, olives, figs, oranges, and cotton are raised, usually by the aid of irrigation. SMYRNA is the most important seaport. Locate it. Find TREBIZOND.

FIG. 255.

Spinning as done in Palestine and other parts of Turkey in Europe.

The inhabitants, though so near Europe, have not advanced as Europeans have. The valuable minerals are scarcely worked at all; herding and farming are carried on in much the same way as in the time of Christ; and there is practically no manufacturing excepting that done by hand (Figs. 255 and 257). Some of this work, however, is very beautiful, as, for example, the Turkish rugs already mentioned (p. 345).

The unfortunate history of the region furnishes an explanation of its lack of development. Asia Minor, the peninsula between the Mediterranean and Black seas, was the pathway

for the ancient caravan trade between Europe and Asia. While this brought prosperity, it also led to many invasions. More than five centuries before Christ the country was conquered by the Persians; two centuries later it came under the control of the Greeks; and later still it became a part of the Roman Empire. After that, with the decline of the Roman Empire, came invasions by wandering Turks, Tartars, and others. It was by this route that the Mohammedan Turks gained a foothold in southwestern Europe, and by their occupation devastated the country. Notwithstanding Mohammedan persecution, many of the inhabitants still profess the Christian religion, although at great cost, as is proved by the recent terrible massacres of the Armenians.

FIG. 256.
A view of Bethany and the mountain slopes near Jerusalem.

There are two parts of Turkey in Asia that merit special mention; namely, the *Holy Land*, and the valley of the Euphrates and Tigris rivers, or *Mesopotamia*.

The Holy Land (Fig. 259).—This part of Turkey in Asia possesses peculiar interest for us. Back of a straight coast, with no good harbors, lies a narrow coastal plain, beyond which are two low mountain ranges including between them the remarkable depression in which the Dead Sea is situated. While Hebron (Fig. 259) is about three thousand feet above sea level, the surface of the Dead Sea, a few miles to the east, is almost thirteen hundred feet below sea level, being the deepest depression on the lands of the world. Although fed by the river Jordan (Fig. 258), which flows out of a fresh-water lake, the Sea of Galilee (Fig. 260), the Dead Sea is so dense from the salt it contains that a person cannot sink in it. The fact that it is salt shows that the climate is arid, for otherwise the depression would be filled with water, and, by overflowing, the sea would soon become freshened. The Jordan Valley lies no farther south than southern Alabama; yet since it is so low and enclosed, its climate is almost tropical.

FIG. 257.
Armenian women spinning.

Before the coming of the Jews this region was divided into small countries, often under the rule of their more advanced and powerful neighbors, the Egyptians. Then the Jews entered this "promised land" and created a

kingdom which attained its greatest power under Solomon. It was here that many of the events in the Old Testament occurred, including the advance in religion from the belief in many gods to the acceptance of one all-powerful God. Persians, Egyptians, and Romans later ruled over Palestine, and it was during the control of the latter people that Christ was born at Bethlehem. What

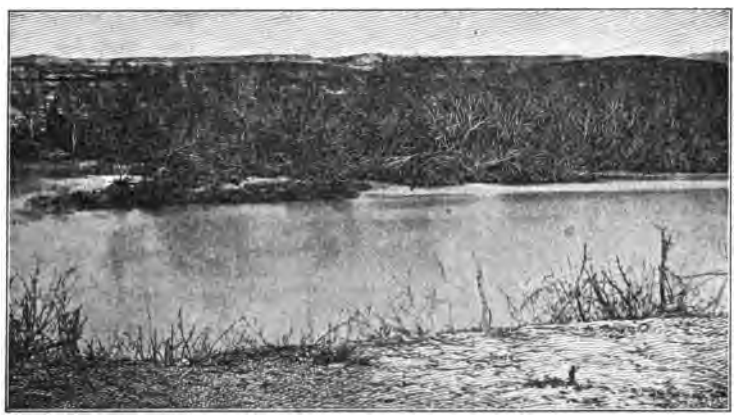


FIG. 258.
The river Jordan.

events in the life of Christ can you mention that occurred at some of the places marked on the map? (Fig. 259).

At that time, as we learn from the Bible, the region was highly developed. Wheat was raised upon the uplands, and olives, figs, and grapes in the valleys, while herds of sheep roamed over the plateaus and mountains. Recall events from the Bible that indicate these occupations. Palestine lay on the great caravan route which, leading from Egypt to the distant East, ran northward as far as DAMASCUS (Fig. 241) in order to avoid the Syrian desert.

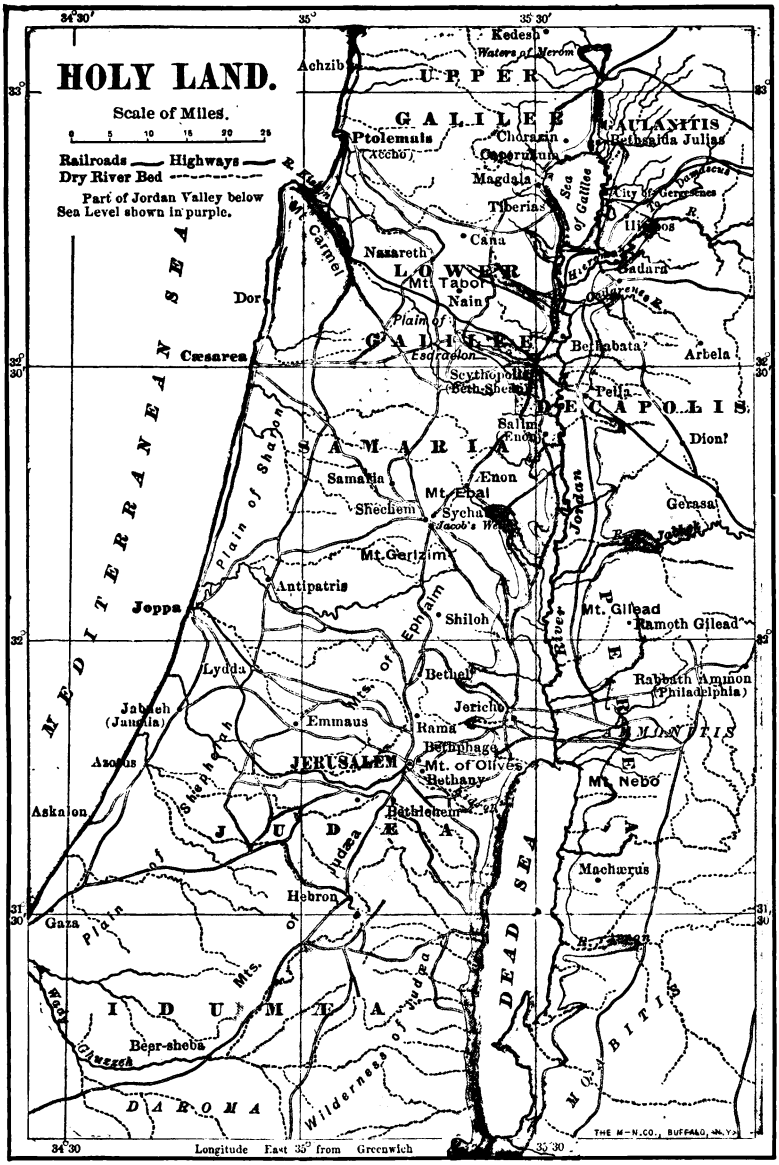

HOLY LAND.
Scale of Miles.
0 5 10 15 20 25
Railroads
Highways
Dry River Bed
Part of Jordan Valley below Sea Level shown in purple.
MEDITERRANEAN SEA
DEAD SEA
UPPER GALILEE
LOWER GALILEE
GAULANITIS
SAMARIA
DECAPOLIS
PEREA
JUDÆA
IDUMÆA
DAROMA
MOABITIS
AMMONITIS
Kedesh
Waters of Merom
Achzib
Ptolemais (Accho)
Chorazin
Caperuaum
Magdala
Tiberias
Sea of Galilee
Bethsaida Julias
City of Gergesenes
Hippos
Cana
Nazareth
Mt. Tabor
Nain
Gadara
Dor
Plain of Esdraelon
Bethabata
Arbela
Cæsarea
Scythopolis (Beth-Shean)
Pella
Salim (Enon)
Dion?
Samaria
Enon
Mt. Ebal
Shechem
Sychar
Jacob's Well
Gerasa
Mt. Gerizim
Antipatris
Joppa
Shiloh
Mt. Gilead
Ramoth Gilead
Lydda
Bethel
Rabbath Ammon (Philadelphia)
Jabneh (Jamnia)
Emmaus
Jericho
Rama
Bethphage
Azotus
JERUSALEM
Mt. of Olives
Bethany
Mt. Nebo
Askalon
Bethlehem
Machærus
Hebron
Gaza
Beer-sheba
Wady Ghuzzeh
Plain of Sharon
Plain of Shephelah
Mts. of Ephraim
Mts. of Judæa
Wilderness of Judæa
River Jordan
Jordan
Damascus
Hieromax
Jabbok
Arnon
Longitude East 35° from Greenwich
THE M-N.CO., BUFFALO, N.Y.

FIG. 259.

Throngs of people, therefore, passed this way. Jerusalem (Fig. 259), the capital, was a great city, situated upon a lofty elevation that made it an important stronghold.

The city is now visited by many Christians, and also by Mohammedan pilgrims who believe that Mohammed ascended

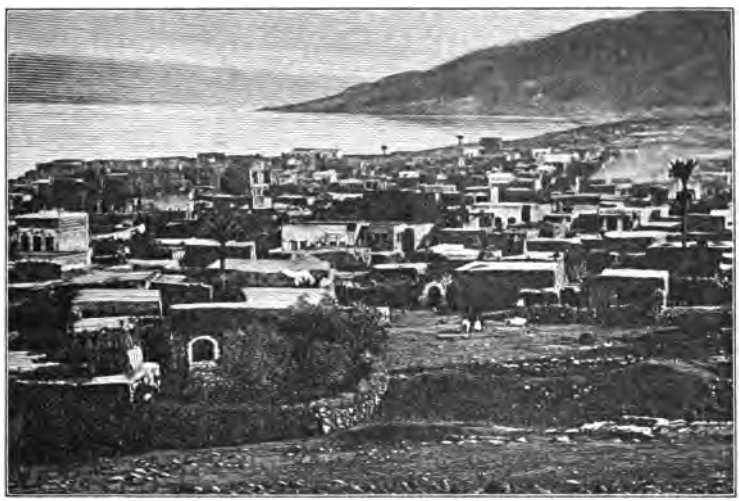


FIG. 260.
Tiberias on the Sea of Galilee.

to heaven from there. Very little of importance is to be seen, for much of the country, once "flowing with milk and honey," is in ruins. Even the usual mode of travel is by mule or camel, as in olden times, although a short railway climbs the mountains from the sea-coast, at JOPPA, to JERUSALEM, and another follows the old caravan route through NAZARETH, past the Sea of Galilee to DAMASCUS. Trace these two lines. Recently a steamboat has been placed on the Dead Sea for the use of tourists.

Mesopotamia: — This region, including the fertile valleys of the Tigris and Euphrates rivers, has suffered the same fate as the rest of Turkey in Asia. Formerly a country of great resources, crossed by a network of irrigation canals, "a garden of the Lord," it has been devastated by the Arabs and Turks until it is now almost a waste. Babylon and Nineveh, once the seats of a wonderful civilization, are now marked only by mounds of ruins. From these ruins records are at present being unearthed which promise to throw much light upon ancient history.

FIG. 261.
A part of Bethlehem.

There is still some agriculture by irrigation; but, now that the rivers are no longer prevented from overflowing, the fertile plains are for the most part untilled. The sites of the gardens of old are at present either barren desert or fever-breeding swamp; and the nomad has replaced the farmer.

Under such conditions there can be little commerce, though the Tigris is navigable with steamboats as far up as BAGDAD. This city, situated on the caravan route to the east, was of much importance in ancient times. There is still some trade between Europe and India along this route.

Arabia. — This peninsula is a plateau several thousand feet in elevation, with a fringe of mountains (Fig. 263), most prominent in the south and west. What waters

border Arabia? Since the coast line is wonderfully regular, there are few harbors and therefore few coastal cities. Nevertheless, the enclosed seas favored the early development of navigation here as in the Mediterranean. Therefore in very early times Arabian ships carried on commerce with Africa, India, and even with eastern Asia.

The climate is hot along the coast, but cool on the plateau and among the mountains. A great part of the

FIG. 262.
A view in Jerusalem.

interior is desert, and almost everywhere the rainfall is light. Why? (p. 359). What about large rivers? Coffee is raised in the southwest, near MOCHA; the date palm flourishes in many places; and fruits and vegetables are produced in many of the valleys. Myrrh and frankincense, mentioned in the Bible, are obtained from the gums of shrubs that grow on the arid slopes of southern Arabia.

In so unfavorable a climate the population is necessarily sparse and largely nomadic. Cattle, sheep, goats, horses,

donkeys, and dromedaries are raised in large numbers, the three last being celebrated for their excellent qualities.

Most of the Arabian peninsula is independent, though without a well-organized government. Turkey controls the west coast and the Persian Gulf coast as far as *Oman*. Oman, whose capital is the seaport of MASKAT, was formerly an important kingdom; it still has extensive pearl fisheries.

FIG. 263.
A view among the Arabian mountains.

The British have a foothold on the southwestern coast at Aden, one of their most important coaling stations. The city of ADEN, whose excellent harbor is well fortified, is in a great crater surrounded by barren hills (Fig. 264). It is as large as Sacramento, Cal., yet there is not enough rainfall to supply the necessary drinking water, although great reservoirs are built to store it. An additional supply is obtained by condensing the steam made from boiling sea water.

MECCA, a Turkish city about fifty miles from the sea, is sacred to all Mohammedans. It was here that Mohammed was born, and every Mohammedan is supposed to make a pilgrimage to it at least once during his lifetime. Most of these pilgrims come by sea, and every year the city, as well as the roads leading to it, are crowded with them.

Persia. — Like Arabia, Persia is an elevated table-land with large tracts of desert and salt steppes of little or no use to man. The arid climate prevents the formation of large rivers; but the rains and snows of the parallel

mountain ranges permit some irrigation in the broad valleys. There is so little rainfall, however, and evaporation is so rapid during the hot, dry summer, that water for irrigation is often led from the mountains in underground tunnels. Why are tunnels preferable to ditches?

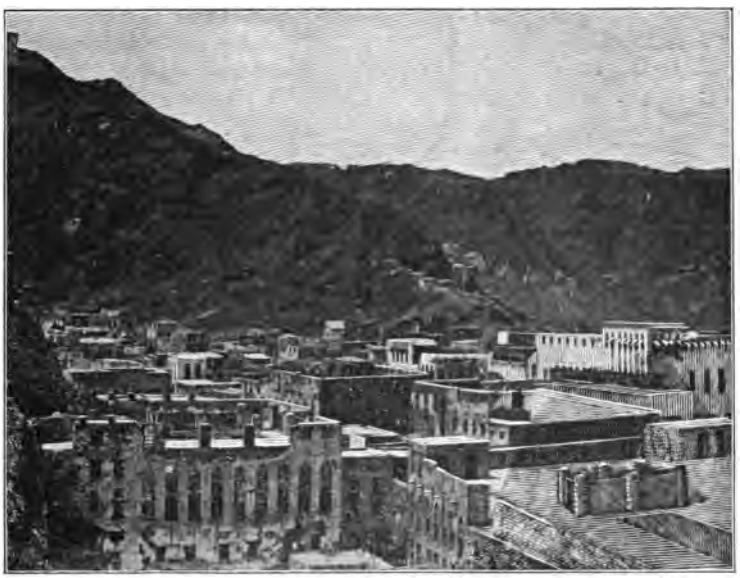


FIG. 264.
A view of a part of Aden from the city water tanks.

The main farm products are tobacco, wheat, barley, cotton, and opium. Much silk is also produced, and roses are cultivated for the manufacture of attar of roses. The principal agricultural portion is near the Caspian Sea, where there is sufficient rainfall for crops and also for extensive forests on the mountain slopes. Among the

mineral deposits is the precious stone turquoise; but there is little mining. Along the coast of both Arabia and Persia precious pearls and pearl shells are found.

Nearly two million Persians belong to nomadic tribes (Figs. 265 and 266) which roam about the desert, dwelling in tents, and herding goats, sheep, and other animals. There is no extensive manufacturing, but the Persians, like the Turks, do some very beautiful hand weaving, as, for example, shawls and rugs. Their carving and inlaid metal and wood work are also wonderfully artistic.

FIG. 265.
A drove of camels in Persia.

The government of Persia resembles that of Turkey and is therefore very bad. The ruler, or *Shah*, an absolute monarch, controls the lives and property of his subjects, who are mostly Mohammedans. TEHERAN, the capital, has some beautiful mosques, though the dwelling-houses are made of sun-dried bricks and face narrow, filthy streets (Fig. 267).

Afghanistan. — This country, "one of the waste places of the world," is a region of sand, bare rocks, and snow-capped

mountains. Only in the valleys is the soil made to yield a harvest; and even there the cold, blustering winters and the dry, scorching summers make one of the worst of climates. Under such unfavorable conditions there has developed a people noted for hardiness, stubbornness, bravery, and cruelty.

FIG. 266.
A Persian nomad girl.

Little is known about Afghanistan. Entrance to the country across the lofty mountain passes and desert sands is exceedingly difficult; and the Afghans have a hatred for all Christians, especially for the British, whom they have fought fiercely. Indeed, it has been said that the boundary between India and Afghanistan should be "drawn in crimson," because of the blood spilt there. Since Great Britain has pushed her Indian frontier northward, while Russia has encroached on the opposite side of Afghanistan, this country is often called the "buffer state" between these two rival powers.

As in other Asiatic countries so far studied, the government is very bad. The ruler, the merciless *Amir*, holds his authority by means of the terror which he inspires. His seat of government is at KABUL, nestled among lofty mountains.

Russia in Asia. — This vast section of the Russian Empire includes about one-eighth of the land surface of the globe. There are several divisions, such as Turkestan and the dependencies of Bokhara and Khiva; but by far the largest is Siberia, which is a million square miles larger than Europe, and even larger than the United States, Mexico, and Central America combined. Yet it has less than one-twelfth as many inhabitants as the United States alone.

FIG. 267.
A wedding procession passing through a street in Teheran.

The climatic belts of Russia in Asia are merely a continuation of the belts in European Russia (p. 266). In the north of Siberia are the tundras, with a scattered people who resemble the Eskimos (Fig. 268) of North America and make a bare living by the help of the reindeer (Fig. 48). South of the tundras are the forests (p. 359), containing many valuable fur-bearing animals, such as the sable, ermine, and fox, and peopled mainly by

hunters and lumbermen. There are some farms in the clearings; and when the forests are removed this should become a great agricultural region. Still farther south are the broad Kirghiz steppes (p. 359), watered enough for farming in the north, but more and more arid toward the south in Turkestan and Bokhara.

FIG. 268.
A Yakout woman from the cold tundra region of Siberia.

While there are some tracts of salt-covered plains and sandy desert where men do not live, most of the steppe country is adapted to herding. Upon these steppes, grass and flowers appear in spring when the snow melts; but the drought soon comes, and the plants wither. Then, as in western United States, the country looks like a desert, though sheep, cattle, goats, horses, and camels find much nourishment in the dried grass, which is a kind of natural hay.

Siberia has attained a reputation in the past, mainly as a source of minerals, and as a place of exile for Russians whom the government wishes to dispose of for political or other reasons. Gold has been found in a number of places, as in the Urals and near Lake Baikal, the largest fresh-water lake on the continent. But while there is much mineral wealth in Siberia, there has been little mining, excepting in the western part near Russia.

A new era seems about to open for this vast empire, for the Russian government is now constructing extensive railways

which will open up the country for development. One system extends eastward from the Caspian Sea to Turkestan (Fig. 241), while another and longer one reaches from Russia in Europe to the Pacific Ocean. Trace it on Figure 241. Hitherto transportation across the vast plains, arid steppes, and rugged eastern mountains has been difficult in the extreme. While the large rivers are very useful in summer, their importance for commerce is greatly lessened because some of them lead into salt lakes without outlet, while others enter the frozen Arctic and are themselves frozen over during a large part of the year.

FIG. 269.
A village in Siberia.

Heretofore the products of Siberia could not easily be exported; nor could machinery and other manufactured articles be brought in without the greatest difficulty. But by the building of railways we may expect a rapid development of Siberia, whose resources are far greater than the sparseness of the population would indicate. Indeed, since the longer railway was begun there has been a rapid increase in population and exports, especially of corn.

There are some important cities in Russia in Asia. The largest in the southwest is TASHKEND, which is about the size of Indianapolis. TIFLIS, between the Black and Caspian seas, is really in Asia, though the Russian gov-

ernment classes this region with its European provinces. It is about the size of Tashkend. There are a number of other cities with a population of from fifty to a hundred thousand. In Siberia there are no large cities, though several along the railway, including IRKUTSK and VLADIVOSTOK, are now growing rapidly.

FIG. 270.

The valley of Cashmere among the mountains of northern India.

India. — This densely populated peninsula, with its warm climate, offers a striking contrast to cold, sparsely populated (Fig. 253), and slightly developed Siberia.

Physiography and Climate. — Lying largely in the torrid zone, the Indian peninsula has a hot climate. Its position in the trade-wind belt might lead us to expect much desert, especially on the lee or western side. But this coast really has a heavy rainfall because it is

reached by the summer monsoons (Fig. 33). In the winter, however, when the winds blow from the land, the climate is so dry that plants wither; and in Baluchistan, which is not affected by the summer monsoons, there is true desert. Southern India and Ceylon, on the other hand, have a heavy rainfall at all seasons. Why?

India, which is in the form of a triangle, has a remarkably regular coast and therefore few good harbors. Most of the peninsula is a plateau, rarely more than two thousand feet high and largely covered with lava flows like those of the Snake River Valley of western United States.

FIG. 271.
Natives of the Cashmere valley (Fig. 270).

North of the plateau is a broad lowland occupied by the Brahmaputra, Ganges, and Indus rivers, which, like the Po of Italy, have built the plains out of sediment brought from the mountains. Among the lofty mountains which lie to the north of the river plains, the highest are the Himalayas, in which there are scores of peaks each reaching an altitude of over four miles. Even the mountain passes are from seventeen to nineteen thousand feet above sea level, or much higher than Mt. Blanc in the Alps.

Farming. — This mountain system has formed a north-

ward barrier to British conquest, as in former days it served as a barrier to invasion from nomadic hordes which overran Asia Minor. With such protection the fertile plains and deltas of the three great rivers became the seat of early civilization. From the very earliest times the people have been engaged in farming, and at present fully three-fifths of the population follow that occupation.

As there are 287,000,000 inhabitants in an area of about 1,559,000 square miles, it will be seen that there is an average of 184 persons for every square mile; and in parts of the country there are 500 per square mile. The density of population may be better understood by remembering that there are only twenty persons per square mile in the United States. There are, in fact, almost as many people in India as in North America, South America, and Africa together.

FIG. 272.
A tea plant.

Millet, which grows on the dryer lands, and rice, which is raised on the river lowlands where the land can be flooded, are the staple foods of the natives. After the dense population is fed, however, little is left for export. Wheat, on the other hand, is raised for export, and India is a vast granary for Great Britain. Much cotton is also produced. Some of this is manufactured into coarse

fabrics for use at home and for export to China and Africa; but much is exported as raw cotton, for use in the cotton mills of Great Britain. Other agricultural products are tea, sugar cane, tobacco, opium obtained from a species of poppy, indigo of value as a dye, and jute grown upon the sandy river bars for the sake of its coarse, strong fibre.

FIG. 273.

A native village near Calcutta — notice the bamboo on the right.

For the production of rice, and for other crops as well, irrigation is necessary in many places. Therefore this country, favored by large rivers fed by the rains, snows, and melting glaciers of the mountains, has some of the most extensive irrigation works in the world.

Forests and Wild Animals. — There are valuable forests on the mountain slopes, where the trees, including pines, firs, and junipers, resemble those of Europe; and there are also magnolias and the beautiful deodar, a species of cedar. In the hotter portions are valuable medicinal plants and spices, such as pepper and cinnamon. The teak, whose strong, durable

wood is of great value in building, and the mango, whose fruit is important as a food between harvests, are both common in many localities. Besides these, the bamboo and various palms are of great value. The bamboo is employed in hundreds of ways in making implements and building houses (Fig. 273); and the palms supply juices for drink, fibre for ropes and mats, and cocoanuts (Fig. 251) for food and oil.

In parts of the Ganges Valley and elsewhere there are *jungles*, or tracts of waste land densely covered with bamboos, canes, etc., and very difficult to penetrate. From these wastes the lion has almost disappeared; but the elephant is still found, and there are various species of the monkey; also the rhinoceros, buffalo, leopard, wild boar, wolf, and Bengal tiger (Fig. 248). The tiger is much dreaded, for it not only preys upon cattle, but even attacks men. Among the Himalayas, goats, sheep, asses, and dogs still exist in a wild state. Crocodiles live in the rivers; and venomous serpents are said to kill as many as twenty thousand persons each year.

FIG. 274.
A bullock cart in Bombay.

Domestic Animals. — Owing to their religion the *Hindus*, as the people of India are called, live mainly upon vegetable food. But many animals, such as the yak, elephant, camel, and buffalo, are raised for a variety of purposes (p. 362). Large numbers of sheep are kept for their wool, and humped cattle for their milk—

an important article of food — and also as draught-animals. Since fish are eaten, fishing is an important industry.

Mining and Manufacturing. —In addition to the raw products of farms and forests there are valuable minerals, including salt, petroleum, coal, and iron. India has long been noted for hand-made goods of great beauty; but with the exception of these there is little manufacturing. Of late, however, there has been a marked development of cotton manufacturing by machinery.

It is even more unnatural that cotton should be shipped all the way to England for manufacture than that the cotton of our Southern States should be sent to England and New England. Therefore, as the South is learning to make cotton goods near the cotton fields, so we may expect that the people of India will in time develop an extensive cotton-manufacturing industry in their own country.

Famines and Plagues. — Although these people are so extensively engaged in agriculture, there are times when they do not raise enough food for their own use, and then terrible famines result. These occur when rain fails; and it may be that one section suffers while another has an abundance. With the building of railways the danger of famines decreases, for then different sections are brought more closely together. The first railway was begun in 1854, and there is now a network across the peninsula (Fig. 241).

But even the railways do not entirely remove the danger; and probably famines will not cease so long as such vast numbers depend entirely upon the products of the soil. There is need that some of them adopt other forms of industry, as for example manufacturing, and thus secure the means of buying food from other less densely settled regions. An even greater need is the construction of still more extensive irrigation systems, for there is rainfall enough in some seasons if the water could be stored in reservoirs for use when wanted.

India has also been visited by plagues which have destroyed tens of thousands of lives. With a population so dense, in a climate so hot, disease spreads with rapidity and with terrible effect, particularly among people who are not properly nourished and whose surroundings are not always the cleanest.

People. — India was originally inhabited by a swarthy race, which was gradually replaced by white people, or Aryans, from the north, who now make up the bulk of the population. Although protected by the sea and by the mountains of the north, a break in the mountain barrier in the northwest has permitted attack from that direction. But the various invasions from that quarter have never completely devastated the country, as was done in Asia Minor. One of these invasions was by the Mongols, who introduced Mohammedanism into northern India. The capital of their empire was DELHI, and it is said that the present Delhi is built upon the ruins of ten older cities.

FIG. 275
A tomb and mosque in India.

Religion. — India is the home of *Brahmanism*, which is professed by three-fourths of the people, while about one-fifth are Mohammedans. There are only about seven million Buddhists and two million Christians. Brahmanism, as already stated (p. 93), teaches the belief in caste, which is quite different from our belief in the equality of man with man, and is a great drawback to the development of the people. How? Although grouped under the general term of Brahmanism, these people

have a great variety of religious beliefs and customs, as might be expected in a country made up of many tribes speaking different languages; but throughout India there are numerous general customs based upon the rule of the priests or *Brahmans*.

The people have many religious superstitions. For example the Ganges, doubtless because of its great value for irrigating and fertilizing the soil, is considered a sacred river (Fig. 279); and bathing in its waters is supposed to wash away disease, though, since the waters are also used for drinking, this custom is no doubt responsible for the spread of much disease. The conscientious Hindu makes at least one pilgrimage to the holy river as a means of gaining divine favor and forgiveness.

FIG. 276.
The Great Pagoda in India — a sacred temple.

Government.— Over three hundred years ago a company of London merchants obtained a foothold in India for trading purposes. The peninsula was then divided among many native rulers, and at various

times the British government was called upon to settle disputes between them. Partly in this way, and partly through the necessity of intervening for the protection of British subjects engaged in the Indian trade, Great Britain gradually gained control of the peninsula. India was formally transferred to Great Britain in 1858, and in 1877 the Indian Empire was established as a part of the

FIG. 277.

Elephants at work in a lumber yard in Burma.

British Empire. The king of the British Isles is also styled Emperor of India.

By their protection and wise direction, the British are able to maintain their hold upon this vast country, whose population is more than seven times that of the British Isles. Throughout India there is an average of but one Britisher to every three thousand natives, and by far the greater number of government officers are Hindus. One of the members of the

British ministry is Secretary of State for India; and, as in the case of Canada, a governor-general, called the *Viceroy,* is sent from Great Britain as chief executive officer. The British have not attempted to overturn the numerous native states; nor have they interfered seriously with the firmly established customs of the people. They have endeavored to guide and direct the people rather than to control them absolutely.

Baluchistan and Burma. — The Indian Empire is not confined to the Indian peninsula. It includes also the desert country of Baluchistan to the west and fertile Burma to the east. In the latter country there are great numbers of Mongolians, or people of the yellow race. Vast quantities of rice are raised, and there are other valuable products, as rubies, sapphires, and tropical woods. In Burma the elephant is used for moving logs (Fig. 277), drawing ploughs, and carrying passengers. RANGOON, the seaport, is noted for its export of rice; but MANDALAY, farther up the Irawadi River, is the largest city in Burma.

Base of Himalayas. — Between Burma and the peninsula of India, at the base of the Himalaya Mountains, is the region which has the heaviest rainfall in the world. Much tea is raised on the hills of that section (Figs. 272 and 278); for tea requires a hot climate, an abundance of rain, and sufficient slope to prevent the water from standing about the roots of the plant.

The tea plant, which is three or four feet high, has bright green leaves resembling those of a rose bush. The leaves are picked several times a year, often by boys and girls. After they are picked they are dried in the sun and later in buildings, in order to remove all moisture before packing.

Other Countries. — Just north of this tea district, among the Himalayas, are *Nepal* and *Bhutan,* which, though small, retain their independence because so protected by the mountains.

At one time Portugal and France had important colonies in India; but they now control only very small sections, too small to be shown on our map.

Principal Cities. — So many Hindus are engaged in farming that only about five per cent of them dwell in

FIG. 278.
Picking tea in India.

large towns. Nevertheless, there are seventy-five cities with a population of over fifty thousand, while two, Calcutta and Bombay, have over eight hundred thousand.

CALCUTTA, the largest city, is a seaport on the Ganges delta and the natural outlet of the fertile Ganges Valley; but it has a poor harbor on a river whose volume is variable. It has some manufacturing, — being near coal

fields, — but it is chiefly important as a commercial centre and as the residence of the Viceroy.

Farther up the Ganges are the smaller cities, LUCKNOW and BENARES. The latter, the "holy city of the Hindus," is on that part of the Ganges which is deemed most holy. At this point temples (Fig. 279) line the banks of the river for miles, and a steady stream of pilgrims pours in and out of the city.

FIG. 279.
Temples along the Ganges at Benares.

While there are several cities on the Ganges, there are none on the Indus large enough to find a place on our map. This is not because the Indus is useless for irrigation, but because of shallow waters and sand bars which interfere with navigation. These are due to the fact that the river, though well supplied with water from the mountains, loses much of it by evaporation in crossing the arid plains. Thus it is obliged to deposit some of its sediment as sand bars in its channel.

BOMBAY, next in size to Calcutta and the nearest port to England, is a great business centre. It is, moreover, the only Indian city with a really good harbor. MADRAS, the third largest city, is situated at a point where there is only an open roadstead protected by a breakwater.

FIG. 280.
A group of kings in Ceylon.

Ceylon. — With a fertile soil, abundant rainfall, and high though equable temperature, Ceylon is a beautiful tropical garden, and was considered by the Arabs to be the Garden of Eden. A chain of islands and coral reefs which nearly connect Ceylon with the mainland is therefore called "Adam's Bridge." Over this it is proposed to extend a railway from the mainland. Among the products of Ceylon are cocoanuts, rice, fruit, coffee, and tea. The island is the third most important tea-producing section in the world. Other products are sapphires and rubies from the stream gravels, and beautiful pearls and mother of pearl obtained from shellfish which live among the coral reefs.

Indo-China and the Malay Peninsula. — This peninsula consists of a series of mountain chains, spreading fan-

shaped southward, with numerous long, narrow valleys between, which broaden toward the south and terminate in fertile, populous delta plains at the river mouths. In addition to Burma, a part of the Indian Empire, there are three divisions of this peninsula: (1) *Siam*, (2) *French Indo-China*, and (3) the *British Straits Settlements*.

Siam. — In this tropical country most of the inhabitants, who are either Chinese or Malays, live along the rivers and irrigation canals, where they are largely engaged in the production of rice. Millet, which is raised in the drier places, competes with rice in importance as a food. Among the mineral products are rubies, sapphires, gold, and tin. The forests yield tropical woods, especially teak wood, for use at home and for export.

FIG. 281.
A Buddhist temple at Bangkok.

Siam is a monarchy, the king being assisted by a council of ministers and a legislative body of noblemen. The poorer classes are still kept in a kind of serfdom by the local governors; that is, they may be compelled to labor for the governors for two or three months each year.

BANGKOK, the capital and largest city, is situated on the banks of a muddy river up which vessels of small draught are able to pass to the city. Most of the inhabitants live either in poor houses on narrow, ill-kept streets, or else in boats and

floating houses on the river; but the king has magnificent palaces decorated with carved marble and frescoed with gold. Buddhism is the religion of the country; and in Bangkok alone there are said to be ten thousand Buddhist priests whose temples (Fig. 281), decorated with gold, silver, and jewels, are wonderfully gorgeous. Next to the king the white elephant is held in highest reverence, and Siam is often called "the Land of the White Elephant."

French Indo-China. — This dependency of France resembles Siam in climate and people. Its forest-covered hills yield valuable teak and iron wood, and in its valleys are extensive fields of rice and millet. Rice culture is here favored by the warm, damp climate and by the broad, easily flooded deltas and flood plains of the Mekong and other rivers. Silk, cotton, tea, and spices are other products, and there are also extensive coal beds. Some coal is exported.

FIG. 282.
A Malay house in the Straits Settlements.

Straits Settlements. — This is the name given to the British possessions on the southern end of the Malay peninsula. In that hot, damp country, so near the equator, such tropical products as rice, cocoanuts, gutta-percha, and spices are obtained. Extensive deposits of tin are found in this region, which supplies about half the tin used in the world. The mining is done crudely by Chinese, while the native Malays are mainly engaged in farming and fishing.

The only city of importance is SINGAPORE, situated almost on

the equator, on a small island barely separated from the southern tip of the Malay peninsula. Being a *free port*, or a port freely open to the commerce of all nations, and being situated on a narrow strait through which many ships of various nations are passing, Singapore is an extremely busy city.

Chinese Empire. *Area and Population.* — This empire, which is nearly as large as Siberia, has more inhabitants than any other nation in the world. It includes nearly half the population of Asia; that is, about the same number as are found in North America, South America, Africa, Australia, the British Isles, and Germany together. Or, otherwise expressed, it has fully twenty-five million more people than live in all of Europe.

FIG. 283.
A scene in the arid mountainous part of China, where camels are used.

The hordes of Chinese who live on the river flood plains and deltas of the south and east make this the most densely settled large area on the globe.

Nevertheless, there are outlying provinces of great extent, such as Mongolia, Turkestan, and Tibet, where the population is very sparse (Fig. 253). This is because of the rugged mountains (Fig. 245) and the vast desert plateaus where the dryness is unfavorable to all industries save herding. There are large sections, as in the great Desert of Gobi, where even this industry is impossible. Strangers find it difficult to enter

some of these remote districts; and the holy city of LASSA in Tibet has been visited, it is said, by only three Europeans. The inhabitants wish to save their city and its sacred temples from intrusion, and they capture and often torture those whose curiosity leads them there. Over these wild regions the Chinese government is able to exert only a very slight authority.

Climate. — Most of the densely settled part of China has a temperate climate with an abundance of rain during the summer monsoon. In the north, for example near Peking, which is in about the same latitude as Philadelphia, the summers are warm and the winters cold; but farther south, as at Canton, just south of the Tropic of Cancer, the climate is tropical, and there is rain throughout the year. Toward the interior the climate grows steadily drier, and, with increasing elevation, colder also.

In the China Sea, as in other parts of southern Asia, fierce typhoons are encountered in the late summer and early autumn. They resemble the hurricanes which develop in the West Indies and often cause great damage along their path, which frequently skirts our southern coast, and then extends northeastward into the Atlantic. The typhoons of Asia, developing in the East Indies, also cause much destruction of life and property, especially on the low delta plains, over which great sea waves are driven by the typhoon winds.

The rains and snows of the Chinese mountains supply water for a number of large rivers. The two most important are the Hoang-ho and the Yangtse-kiang (Fig. 244), whose floods spread out over the broad deltas and flood plains, thus depositing sediment and adding fertility to the soil. The greatest rise, which in the Yangtse-kiang reaches a height of fully forty feet, occurs during the summer rains, between July and October.

It is with great difficulty that the Hoang-ho is controlled, and in the last twenty-five hundred years its lower course has changed eleven different times. In some cases this has caused a change of three hundred miles in the position of the river mouth. A single flood destroyed a million people. Because of the repeated destruction of life and property, the Hoang-ho has been called "China's Sorrow."

FIG. 284.
A Chinese mandarin in his official dress.

People and Civilization. —The Chinese Empire is inhabited by people of varied origin, with different customs, religions, and languages. The Mongolians, who form the basis of the population, apparently came from western Asia, bringing with them the knowledge of irrigation. Although China is partially protected on the west by mountain ranges and desert, the constant danger of invasion by nomads led, as early as 212 B.C., to the construction of the Great Wall (Fig. 241) along the northern frontier.

This wall, twelve hundred miles long in a straight line, and fifteen hundred miles with all of its windings, passes up and down hill (Fig. 285) and even over a mountain peak. It is twenty-five feet wide and thirty feet high, and at short distances apart are strong watch-towers rising still higher. This wonderful structure, which required armies of men to build, was so well made that it is still perfect in many places.

Long before Europeans had emerged from the state of barbarism, the Chinese had developed a remarkable civilization. The art of printing, the manufacture of gunpowder, the production of silk and silk goods, the baking

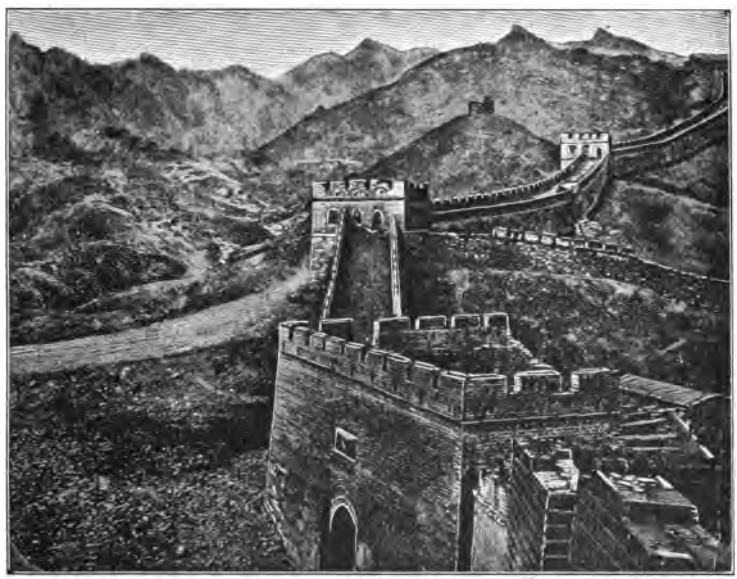


FIG. 285.
A part of the Great Wall of China.

of porcelain or china ware, and other important arts were known to them long before Europeans learned them.

But in spite of their early start, the Chinese have been outstripped by Europeans (p. 364). Their peculiar customs in part account for their failure to advance farther. They are followers of Confucius, and his doctrine is everywhere taught. In fact, no one can be appointed a

government official who has not passed an examination in the Chinese classics, including the doctrine of Confucius.

One of their doctrines is ancestor worship, which leads them to regard new customs as bad. This tends to check development, and is one of the reasons why they object to adopting European and American civilization. The strength of their

FIG. 286.
A scene in a public court at Shanghai.

ancestor worship is indicated by the fact that disobedience to parents is regarded in China as one of the worst of sins, for which children may be whipped to death. By law the punishment for striking a parent is death.

The conservatism of the Chinese is shown by their objection to the introduction of labor-saving machinery, and it is also shown by their means of transportation. Much of the traffic is

carried on by means of canals (Fig. 287), of which the largest is the Grand Canal (Fig. 241), built more than twelve hundred years ago. The rivers are also used (Fig. 244), even where transportation on them seems almost impossible; yet, instead of steam, they make use of poles, oars, and sails. Good roads are rare, and one of the principal vehicles is the wheelbarrow, even for carrying travellers. There are, for example, two thousand passenger wheelbarrows in SHANGHAI. Pack animals and men are used for carrying loads, and the more prosperous persons are carried in chairs by their servants. It is evident that a man's time in China is not valued very highly.

FIG. 287.
A typical Chinese village and canal.

Doubtless one of the main reasons for the Chinese objection to foreigners and their methods is the fear that the introduction of steam and machinery will throw people out of employment. The strength of this fear is illustrated by the fact that when, finally, in 1876, the Chinese government agreed to allow the building of a railway, so much opposition was raised that it was bought up and destroyed. Since then, however, one or two short lines have been permitted. Unjust treatment on the part of European nations, which have seized and held Chinese territory, is another important cause for objection to foreigners. It was a combination of these causes that led to the uprising of 1900, in which an attempt was made to kill all foreigners in China.

Natural Resources.—Though many Chinese are engaged in fishing, both in the rivers and the ocean, they are in the main an agricultural people. Their farming methods are very crude; yet they are so careful and industrious, and labor is of so little value, that they till every bit of land possible. For example, water for irrigation, instead of being distributed only over moderate slopes, as in the United States, is often taken to the very tops of hills. It is first raised from the river by means of wheels, turned either by men or by buffaloes, and then pumped upward from one terrace to the next until the whole hillside has been watered.

FIG. 288.
A Chinese pagoda or temple.

The principal food of the Chinese is rice; but their main products for export are tea and silk. Tea is raised on the damp hill slopes of the south, where the conditions resemble those in India (p. 390). Fully forty thousand men and women are employed in carrying tea into FUCHAU alone. They receive but ten cents a day for their labor. In the warm south, great quantities of silk are obtained, as in France, from the cocoon of the silkworm caterpillar. Some of the caterpillars feed on forest trees, others are carefully fed on the mulberry leaf.

As in other countries of southern Asia, the bamboo is one of the most valuable products. The seeds are ground up for food, and in spring the tender roots and stalks are eaten. The roofs and walls of houses, as well as nearly all articles of furniture, are made of bamboo wood. It is, moreover, woven into mats, baskets, and hats, while paper is made from its pulp.

The Chinese are an artistic people, and they make some very beautiful china ware and silk fabrics; but they still do the work by hand, as has been the custom for thousands of years. There is almost no other kind of manufacturing, nor is there much development of the wonderful mineral resources. It is said that China contains the largest coal fields in the world, in which both bituminous and anthracite coal occur; and there are also deposits of gold, silver, lead, and iron ore.

Sometime, when China awakens from her long sleep, there will be a wonderful advance of this vast empire of varied resources and really able people. Many Chinamen are well educated, and as a race they are noted for their politeness, honesty, and thrift. These qualities are well recognized in the East Indies and southeastern Asia, where so many of the tradesmen are Chinese. They need merely to appreciate the advantages of modern civilization; and it would be a help to this end if the people of Europe and America had a better understanding of the excellent qualities of the Chinese.

Government. — The Chinese government is peculiar. The *Emperor*, who has a right to nominate his own successor, is known as the "Son of Heaven." He has under him a *Viceroy* for each province, who must collect money for the imperial government, but is partly independent of the Emperor. The present Emperor is not a Chinaman but belongs to the Manchu division of the yellow race, which invaded and conquered China in 1644. It was then that the Manchu custom of wearing a long queue, or "pigtail," was introduced into China.

Principal Cities. — There are many cities in China, all densely crowded. The poorer classes live huddled together, while the wealthier classes and officials dwell in comfort and luxury. The largest city is CANTON, which has more inhabitants than Chicago. It is situated on a densely populated delta and is a port of outlet for productive southern China, being especially noted for its silk. It is said that three hundred thousand people, or one-

FIG. 289.
The harbor of Hongkong.

eighth of the inhabitants, live in boats moored in the river.

HONGKONG (Fig. 289), an island which commands the approach to Canton, belongs to the British. To Hongkong many of the products of China are sent for export to Europe and America. It is therefore a very busy place. HANKAU and WUCHANG, on opposite sides of the Yangtse-kiang River, are important river ports for tea. As in the case of most Chinese cities, the number of inhabitants is uncertain. For example, by some estimates

Hankau has a population of a million and a half, by others, only eight hundred thousand.

The treaty port[1] of SHANGHAI is another large city; but TIENTSIN, the port nearest PEKING, and the northern terminus of the Grand Canal, is still larger, having a population of about a million. It was from this point that the allied forces started, in 1900, to relieve the foreigners who were besieged in Peking by the Chinese Boxers.

PEKING, the capital of China, is situated on a broad, sandy plain. It has been the capital of a kingdom for three thousand years and of the Chinese Empire for over eight centuries. This city, like others in China, is surrounded by a high wall with gates that are closed at night, as of old in Europe. It is a rectangular city, with one portion reserved for the gardens and palaces of the imperial government. This part is known as the "Forbidden City," because the Chinese government refused to permit foreigners to enter it.

Korea. — This mountainous peninsula has a temperate climate and is adapted to the production of such crops as grains in the north, and rice, tobacco, and cotton in the south. In many respects the inhabitants resemble the Chinese; in fact, Korea was a dependency of China until freed by the war between China and Japan in 1894. While there are great natural resources, including both coal and iron, there has been little advance. The government is an absolute monarchy; the people have few rights; and, until 1882, the country was closed to foreigners. But now foreign influence is beginning to be felt in this "Hermit Kingdom," whose capital is SEOUL.

Japan. — This island empire extends from Formosa,

[1] Foreigners are not allowed to trade in all Chinese cities, and those ports where this privilege is allowed by treaty are called "Treaty Ports."

captured from the Chinese in 1894, to the Kurile Islands far to the north. How many degrees is that? About how many miles? The location of the islands with reference to the mainland reminds us of the British Isles; and, in fact, Japan's isolation from other countries has secured to her the same freedom from invasion as has long proved of such advantage to the British.

FIG. 290.
The gate at the entrance to Seoul in Korea.

Physiography and Climate. — Notwithstanding the great length of the empire, its narrow islands occupy an area but little greater than that of California. So much of this is mountainous that not more than one-sixth of the surface can be cultivated, and many of the lowlands are difficult to reach because of the rugged surface and the absence of navigable rivers. There are numerous volcanoes (Fig. 242); and, since the mountains are still growing (p. 355), many earthquakes. These are so frequent and violent that in building their houses the people must allow for their force.

Nipon, the main island of Japan, has a warm temperate climate — due to the Japan current (Fig. 38) — and an abundance of rain. Other islands near by have a similar climate; but *Formosa* is partly within the tropics.

Under these conditions, in several respects so unfavorable, a dense population has developed, equal to more than half the number in the United States. In many ways the Japanese are the most advanced people in Asia.

FIG. 291.
A Japanese peasant family travelling.

People and Government. — In early times Japan was invaded by Mongolians from the mainland, who expelled the original inhabitants to the more barren northern islands. From these Mongolians are descended the present Japanese, a people noted for their smallness of stature and their wonderful artistic instinct.

Centuries before the time of Christ they had developed a civilization resembling that of their kinsmen, the Chinese. Their fine taste led to the manufacture of many beautiful articles of silk, metal, glass, and wood. Like the Chinese, they for a long time did not care for modern civilization, and closed their ports to the outside world. In 1853, however, United States war-ships under Commodore Perry entered Yokohama and induced the Japanese to open their ports to our commerce. After this important step the country, in 1868, was freely opened to the world.

One great drawback to the advance of Japan was the nature of the government, which resembled that of Europe in the Middle Ages. While the *Mikado* was nominally emperor, the real power was in the hands of noblemen

who, by the feudal system, had large numbers of peasants, not only to work for them, but to fight when necessary. After the country was opened to foreigners the power of the noblemen was lessened, and the Mikado became the real emperor. At present he is aided by two legislative bodies, one consisting mainly of noblemen, the other elected by qualified voters. There is also a Cabinet appointed by the Mikado, as the Cabinet of the United States is appointed by the President.

FIG. 292.
A Japanese travelling-chair.

Recent Advance. — Since these changes the Japanese have become noted for their willingness to learn the lessons of Western civilization, and their progress has been truly marvellous. New schools have been started, and education has been made compulsory. Americans and Europeans have been induced to go to Japan to teach, and Japanese students have been sent to Europe and America to study in the universities and to learn what they could of Western civilization. Thus, in a generation the Japanese have added to their own knowledge that of Europe and America ; and they have learned their lessons so well that, with their patience, skill, and intelligence,

they alone of all the nations in Asia have taken rank with the great nations of the world.

The progress that has been made is suggested by the following facts: over seven hundred newspapers and periodicals are now published in Japan. While in 1872 there was only one short railway from Yokohama to Tokio, a distance of eighteen miles, there are now more than three thousand miles of rail-

FIG. 293.
A temple in Japan.

way in the empire. There are many large manufactories of various kinds; and, as in the British Isles, cotton and other raw products are even imported for manufacture.

Everywhere there are signs of progress; but many ancient customs are still preserved (Figs. 291 and 292), so that Japan is a peculiar mixture of ancient and modern. There are the Buddhist temples, and idols still worshipped (Figs. 254, 293, and 294); and the sedan chair is extensively used for travelling. Man power (Fig. 295) is much used still for carrying

passengers and merchandise, for there are but few domestic animals in Japan. It seems strange to us to see such customs within sound of the whistle of a woollen factory or railway engine; but to the Japanese the factories and railways are what seem strange, and they deserve the greatest credit for their wisdom in realizing the value of these modern inventions. What Japan has done China may also do if she will.

FIG. 294.
A Japanese Pagoda.

Resources. — Among the mountains there are valuable deposits of gold, silver, copper, iron, and coal; and these are now well developed. The mountain sides are covered with forests of great value, including giant cedars, camphor laurels, and lacquer trees; and wherever the soil is favorable there is agriculture. Among the products of the farm are wheat, sugar cane, and rice, the latter being the chief article of food, as among other Mongolians. As in China, both tea and silk are produced, and these form two of the main articles of export. Much of our tea comes from Japan. Besides these industries, fully two and a half millions of people are engaged in fishing.

Principal Cities. — TOKIO, a city about the size of

Philadelphia, is the capital of Japan. Besides being the home of the Mikado, and therefore having many government buildings, it has numerous manufactories. YOKOHAMA, at the entrance to Tokio Bay, was a mere fishing village when visited by Perry; but since the harbor of Tokio is unsuited for the large modern ships, Yokohama has

FIG. 295.
A jinrikisha, or "man-power-carriage."

FIG. 296.
A view of Yokohama and its harbor.

grown rapidly and now has the largest foreign trade in Japan.

Other important cities, having a population of several hundred thousand, are OSAKA, noted for its cotton manufacturing; KIOTO, the former capital, and the centre of the tea district; and NAGOYA, a centre for porcelain manufacturing, for which Japan has long been noted. All these cities are connected by railway lines, which have been a great aid in the development of their industries. State how.

REVIEW QUESTIONS. — (1) Tell about the size of Asia; also its position with reference to the zones and other continents. (2) Tell about its physiography, including mountains, rivers, and mineral wealth. (3) Describe the climate. (4) Tell about the plants and animals, showing the contrast between northern and southern Asia. (5) What about the use of plants and animals in Asia in ancient times? (6) In what sections were the beginnings of civilization probably made? Why there? (7) Give reasons why Europeans have so outdistanced the Asiatics. (8) Tell about the population of Asia and its distribution. (9) Tell about the religions of Asia. (10) Why is Turkey in Asia of special interest to us? (11) Describe its surface, climate, and industries. (12) Why, and from what peoples, has Asia Minor suffered frequent invasions? (13) Tell about the Holy Land: its surface; climate; history; present condition. (14) Tell about Mesopotamia. (15) Describe the surface and climate of Arabia. (16) Tell about its government, products, and principal cities. (17) Give the main facts about Persia. (18) Do the same for Afghanistan. (19) Compare the area of Siberia with that of various countries of the world. (20) Compare the climatic belts of Russia in Asia with those of Russia in Europe. (21) What about the future of Siberia? (22) Tell about India: its climate and surface; population; agricultural products; forests and jungles; wild and domesticated animals; minerals; manufactures; famines and plagues; people and their religion. (23) How did the British gain control over India, and how is the control exercised? (24) Tell about Baluchistan and Burma. (25) For what are the countries at the base of the Himalayas important? (26) Locate and tell about the principal cities of India. (27) What can you tell about Ceylon? (28) Give the principal facts about Siam. (29) Do the same for French Indo-China; for Straits

Settlements. (30) Tell about China: area; number of inhabitants and their distribution; climate and rivers; people and their early civilization; reasons for their recent lack of development, giving examples; agricultural products; minerals and manufactures; government; principal cities. (31) What can you tell about Korea? (32) Tell about Japan: position; area; physiography and climate; population; people and government; recent advance; resources; chief cities.

REVIEW AND COMPARISON WITH NORTH AMERICA.[1] — (1) How do North America and Asia differ in form, coast line, islands, mountains, direction of rivers, and deserts? (2) What other differences between the two continents can you mention? What resemblances? (3) Is the Canadian Pacific railway north or south of the Siberian railway? Which is the longer? (4) Is San Francisco north or south of Peking? (5) Name the three peninsulas of southern Asia; of southern Europe. Which of the six is nearest the latitude of Florida? (6) Name the large rivers of Asia and of Canada that flow into the Arctic Ocean. On a globe estimate the distance between the mouths of the Mackenzie and Lena rivers. (7) How do the great rivers of China compare in length with the Mississippi? With the Volga? (8) How do the interior lakes and seas of Asia compare in value for commerce with our Great Lakes? (9) With what lake in North America may the Aral Sea be compared? (10) What ocean currents affect the climate of Asia? Of North America? (11) Compare the climatic belts of Siberia with those of Canada. (12) Is western Asia more or less suited to agriculture and commerce than western North America? Why? (13) In what portions of North America and Asia is rice cultivated? (14) Answer the same question for cotton. (15) What important crops in Asia are not extensively produced in the United States? (16) Name some of the leading imports from Asia to the United States. (17) What about mining in Asia compared with that in the United States? (18) Make the same comparison for manufacturing; for railways. (19) What is the prevailing kind of government in each of the two continents? (20) Compare the population of the five largest cities of Asia with the five largest in North America. (21) What are the advantages to the United States of its control of the Philippines? The disadvantages?

[1] Aid in answering some of these questions may be obtained in Section XXV. and Appendix II.

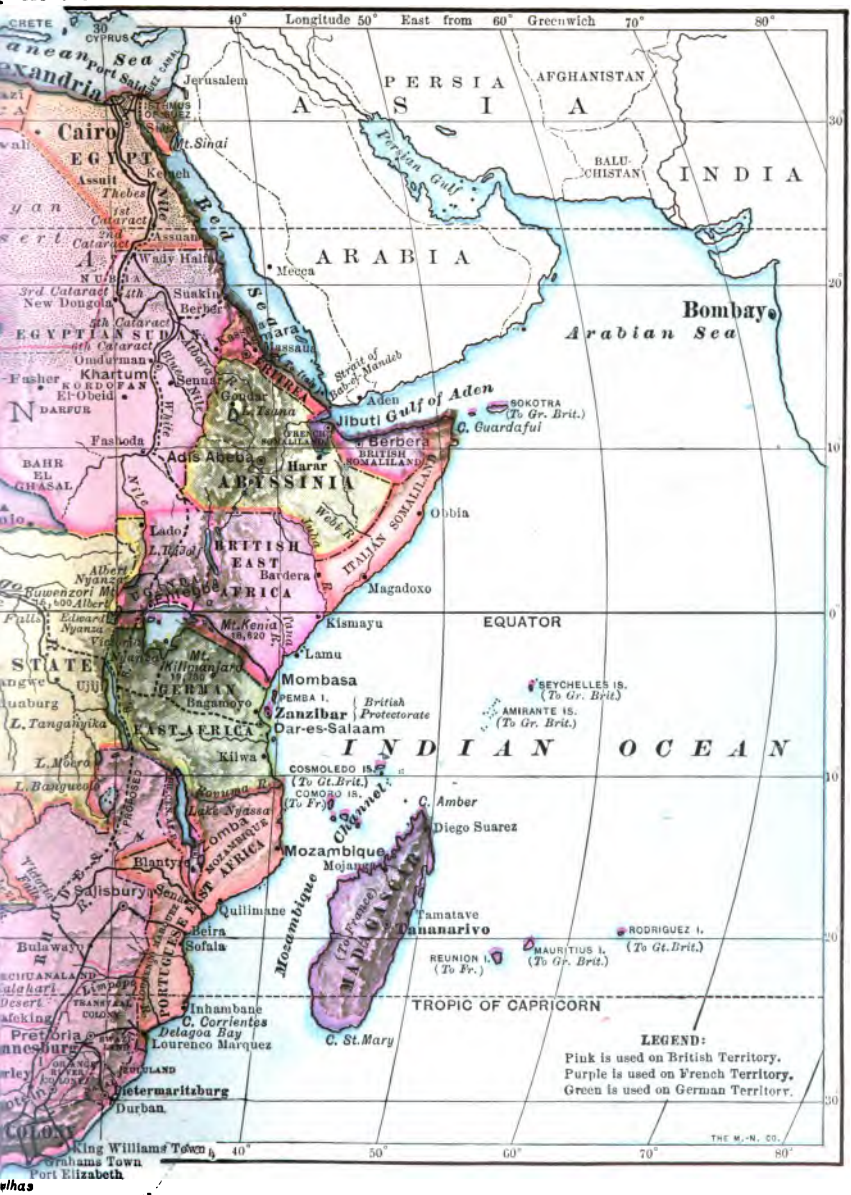
SUGGESTIONS. — (1) What do you know about recent massacres of Armenian Christians by the Turks? (2) Why, do you suppose, has Turkey not laid claim to all of Arabia? (3) Estimate the area of the Holy Land. (4) Make a sand or clay map of the Holy Land (Fig. 258). (5) Point out on the map (Fig. 258) some of the places often mentioned in the New Testament and describe some of the events that occurred there. (6) What Bible events have their scene in Mesopotamia? (7) Write a paper to show to what extent our present civilization is indebted to the Holy Land. (8) Find out some facts about the Crusades. (9) Find out the length of the railway across Siberia. (10) About how far is it by rail from Lisbon in Portugal to Port Arthur on the Pacific? (11) Read Kipling's Jungle Books. (12) Why should the Great Wall of China have less value now than formerly? (13) How is Peking poorly situated for the capital of so vast an empire? (14) Find out about our laws for the exclusion of the Chinese, and the reasons why they were passed. (15) Describe some of the events connected with the siege of the legations and the relief expeditions sent to Peking in 1900. (16) Find some facts about the destruction of Galveston by the hurricane in 1900. Look for an account of the destruction caused by a typhoon in southeastern Asia — they are often found in the illustrated papers and newspapers in October–December. (17) What Asiatic countries have you seen represented among the immigrants to the United States? (18) Examine pictures of buildings in Asia (in this book or elsewhere), to note how different are their styles of architecture from our own. (19) Write a paper telling in what respects you would expect to find an Asiatic city different from one of our own. (20) By what water routes could you go from New York to Tientsin? Would it be nearer to go by rail as far as either San Francisco or Seattle? (21) By what three all-water routes could you go from New York to Bombay? Which is the shortest? (22) Find some facts about Confucius, Mohammed, and Buddha. (23) Who was Omar Khayyám, and what did he write? (24) Find some facts about the conquest of parts of Asia by Alexander the Great. (25) Who first reached India by water? (26) Who was Marco Polo? (27) Find some facts about missionary work in Asiatic countries.

AFRICA.
Scale of Miles.
0 500 1000
Cities with over 200,000: Alexandria
Cities with 100,000 to 200,000: Tunis
Cities with 50,000 to 100,000: Cape Town
Some places with 25,000 to 50,000: Tripoli
Smaller Places: Mozambique
Capitals with less than 25,000: Khartum
Capitals: ◎ Other places: •
Railroads { Finished: Proposed:
Comparative Area
PENN.
45,215 Square Miles.
ATLANTIC OCEAN
EQUATOR
Gulf of Guinea
Cape Coast Castle
Bight of Benin
Bight of Biafra
Strait of Gibraltar
TROPIC OF CANCER
Longitude West from Greenwich
SPAIN
ITALY
MALTA
MADEIRA IS. (Port)
CANARY IS. (Sp.)
C. Juby
Rio de Oro
C. Blanco
CAPE VERDE ISLANDS (Port.)
SENEGAL
St. Louis
Dakar
C. Verde
Bathurst
Bissau
Freetown
Monrovia
FRENCH WEST AFRICA
FRENCH TERRITORY
Timbuktu
Arawan
Agades
Wurno
Sokoto
Gando
NORTHERN NIGERIA
Bida
Yakoba
Lake Chad
Abeshr
Kongo
Ubangi R.
Equatorville
Stanley
Leopoldville
Kabinda (Port.)
Banana
Loanda
Benguela
Mossamedes
Kunene R.
Walfisch Bay (Gt. Brit.)
Angra Pequena
Port Nolloth
Cape Town
C. of Good Hope
ALGERIAN TERRITORIES OF THE SOUTH
Ain Salah
TUAT
Ideles
Taudeni
Mizratah
Ghadames
Sokna
TRIPOLI (To Turkey)
FEZZAN
Murzuk
Gatrun
Tunis
Sfax
Gulf of Sidra
Gardaia
Mogador
Tarudant
Tangier
Mekinez
Wadan
Dakar
Bissao
Kong
Akkra
Adom
Lagos
Benin
Asaba
Calabar
Bida
Yakoba
Kabinda
Banana
Loanda
Benguela
Mossamedes
Kunene R.
Windhoek
Johanna
Kimberley
Cape Town
C. of Good Hope
ASCENSION I. (To Gr. Br.)
ST. HELENA (To Gr. Br.)
ST. THOMAS I. (Port.)
ANNOBON I. (Span.)
PRINCES I. (Port.)
FERNANDO PO I. (Span.)
Gulf of Guinea
40° 30° 20° 10° 0° 10°
30° 20° 10° 0° 10° 20° 30°

FIG. 297.

GREECE

Athens



whas

XXII. AFRICA

MAP QUESTIONS (Fig. 297). — (1) Compare the size of Africa with that of the other continents. (2) Sketch the eastern hemisphere to show the position of Africa. (3) Sketch the outline of Africa, and locate the principal rivers and lakes. (4) What peculiarity do you notice about the location of the mountains? (5) What zones cross Africa? (6) What kind of climate (temperature and rainfall) would you expect to find (*a*) in the extreme north; (*b*) in the extreme south; (*c*) at the equator; (*d*) near the tropics? (7) Find the desert country north and south of the equator. Explain its cause. (8) How does it happen that the Nile has water enough to flow so far through the desert? (9) In what sections are the most railways? What reasons can you suggest? (10) Where are the large cities? Compare their number with those in other continents. Why should there be this difference?

Physiography. — Africa, the second continent in size, resembles South America in outline. Its form is roughly that of a triangle, broad at the north and tapering toward the south. The coast line is remarkably regular, in striking contrast with the coast of Europe, Asia, and North America, and resembling that of South America and Australia. What must be some of the consequences of such regularity? What gulfs, seas, and large islands are found on the map of Africa?

Africa differs from all other continents in its mountain systems. It is mainly a plateau, but near the coast the plateau edges are broken and the rocks upturned, so that there is an almost complete mountain rim. Trace this rim (Fig. 298); from what part of the coast is it absent? In northern Africa the Atlas ranges reach an elevation of fourteen thousand feet; but the loftiest mountains are in

the east central part. Among the latter is the volcanic cone of Kilimanjaro, the highest peak on the continent. Find this peak and trace the mountains from there northward. Notice the elevated land in Abyssinia.

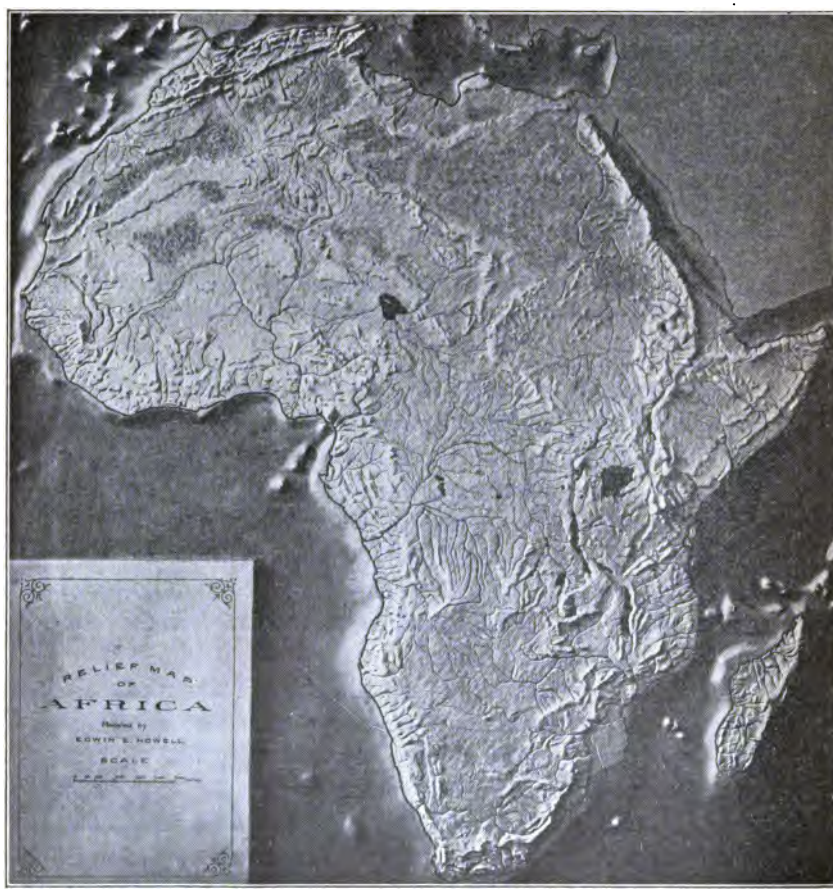


FIG. 298.

Owing to the mountain rim the rivers of Africa are peculiar. For instance, the Niger, after rising among the highlands near the west coast, sweeps around in a great curve before entering the Atlantic. The Zambezi, in the south, also rises near the west coast but crosses the continent eastward to the Indian Ocean. Trace the courses of the Nile and the Kongo, the two largest rivers.

In descending from the plateau each of these streams is interrupted by rapids and falls. Find the Victoria Falls of the Zambezi (Fig. 297); the cataracts of the Nile; also Leopoldville on the Kongo, below which are some falls. Rapids also occur in the Niger. How will these great rivers compare, therefore, with the Mississippi or Amazon as routes for commerce? How must these falls affect the development of Africa?

In one part of Africa there are several large lakes. Name the three largest. Into what rivers do they empty? Notice that they are among the mountains; their basins were not formed by glaciers, as were most lakes of North America, but by movements of the earth's crust.

Climate. — The equator crosses so near the middle of Africa that only the northern and southern ends are in the temperate zones. Therefore the climate of most of the continent, like that of South America, is tropical. Since the altitude of so much of Africa is so nearly uniform, the belts of climate extend nearly east and west. What is true in this respect in South America?

In equatorial Africa, that is for some distance both to the north and south of the equator, there is such a hot, rainy climate that, as in the Amazon Valley, the land is densely covered with a tropical forest (Fig. 299). This is especially well illustrated at the base of the plateau where the narrow strip of coast land is hot, reeking with moisture, and the seat of deadly malaria. These condi-

tions have greatly interfered with exploration, for disease is apt to seize white men even while they are crossing the coastal strip.

The interior, owing to its greater elevation, is somewhat cooler and less unhealthful; but even there tropical heat and rain prevail in the equatorial belt. It is this heavy rainfall that supplies the Kongo and Nile with their immense volumes of water. Both to the north and to the south of the rainy equatorial region is the savanna belt (Fig. 299), where the rainfall varies with the season. Why (p. 34)?

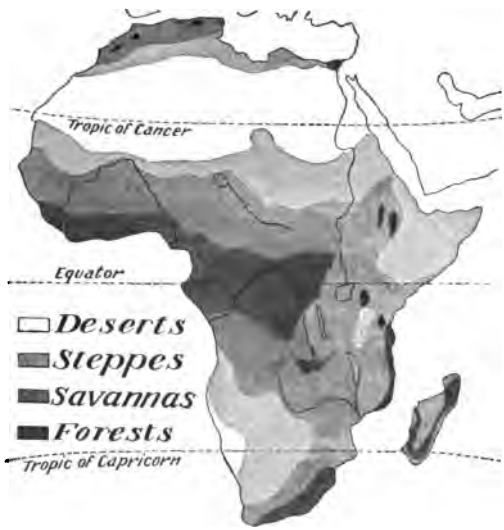


FIG.-299.

To show the influence of climate on vegetation. In the savanna area there are numerous forest-covered sections, especially near the rivers.

In the savannas (p. 55), where the climate is always hot, the rainy season lasts for several months; but the remainder of the year is so dry that trees do not thrive. Therefore, excepting along the streams, the country is open and grass-covered. This condition of drought is suggested on the map (Fig. 297) by the small number of streams. It is also indicated by Lake Chad; for, although a good sized stream enters this lake, it has no outlet. Notice

that the boundary of the lake is marked by a broken line, meaning that it cannot be fixed. During the dry season the lake is smaller than Lake Erie; but with the wet season it rises, overflows the surrounding country, and becomes several times as large. Where are the corresponding savannas in South America? (p. 103).

As the tropical forest grades into the savanna, so the savanna grades into the true desert (Fig. 299), where the influence of the drying trade winds is felt at *all* times of the year. The northern desert is larger and better developed than that south of the equator. This is due partly to the fact that the continent is so broad in the north, and partly to the large land areas which lie to the north and east — the directions from which the winds of northern Africa must come. On the mountain slopes near the Mediterranean there is moderate rainfall; and likewise on the southeastern slopes of South Africa where the winds blow from the sea.

The Sahara, which in places extends to the very shores of the Mediterranean, forms a part of the most extensive desert belt of the world. Trace this belt into Asia. It is characterized by cloudless skies and almost complete absence of rain; but here and there, on the mountain slopes, there is moderate rainfall. It is this which supplies the widely scattered springs and the short mountain streams. In the dry, clear desert air the nights are cool, even in summer, although the midday temperature may reach 100° or even 125° in the shade.

Plants and Animals. — Northern Africa is so close to southern Europe that there is a marked resemblance between the animals and plants on the two sides of the Mediterranean. The desert, however, serves as an effective barrier to their spread southward.

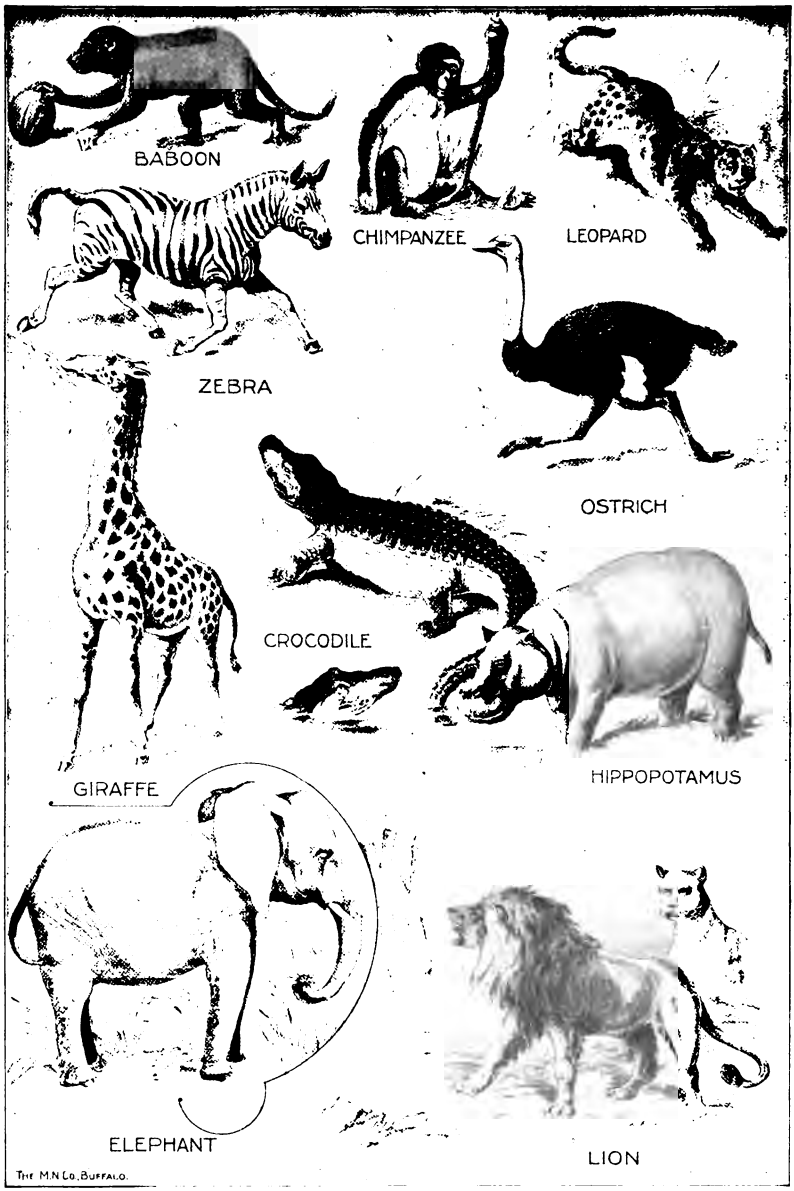


FIG. 300.

Some of the African animals.

Portions of the desert, especially where covered with dunes of moving sand, are almost void of plant life. Animals are also few in number and limited in kind, among them being the ostrich (Fig. 300) and the camel (Fig. 301). What have you previously learned about the plants and animals of the desert? (p. 58). The oases, on the other hand, support a number of plants. Of these the date palm is most notable, for it is an important source of food for the nomads of the desert.

FIG. 301.
The camel.

In the desert of South Africa there is a resemblance to the plants and animals of the Sahara; but many of the species are different. The dense tropical forest is as effective a barrier to the spread of desert life as the desert itself is to the spread of plants and animals that are adapted to humid climates. What would happen to seeds carried by winds or animals from one of these places to the other?

FIG. 302.
A crocodile on the bank of the Nile.

The open country between the desert and the tropical forest abounds in large animals (Fig. 300). Among these, on the savannas, and on the edge of the forest, are the antelope, giraffe, buffalo, zebra, elephant, lion, leopard, and rhinoceros, while the crocodile (Fig. 302) and the huge hippopotamus live in the rivers. The dense forest itself is shunned by many of the larger forms, though teeming with insect life, birds, reptiles, and tree-dwelling mammals. Among the latter are the baboon, the gorilla, and the chimpanzee (Fig. 300).

FIG. 303.
A Zulu warrior in fighting dress.

There is a close resemblance between the animals and plants of Africa and Asia (p. 361). Those of the Sahara are also found in the deserts of Asia; and the tropical life of the savannas and forests of Africa is similar to that of southern Asia. They are, in fact, so closely alike that the two regions are classed as one great life zone, the *Ethiopian*. But although in the same latitude with South America, the African animals and plants differ greatly from those of South America because of the broad ocean barrier.

The People. — Central and southern Africa is the home of the negroes, who are divided into many tribes with different customs. Some are fierce and warlike, others peace-

ful; those dwelling in the forest live by hunting; those upon the savannas, by primitive agriculture and by herding. For centuries they were captured by the whites and sold in slavery; but the day of the white slave-trade is now almost past. In spite of the former frequency of slave-hunting raids, and the great destruction of life in the fierce tribal wars, there are many negroes left. With a fertile soil, and in a warm climate, they are able to support themselves with a minimum of work, especially along the rivers and on the savannas.

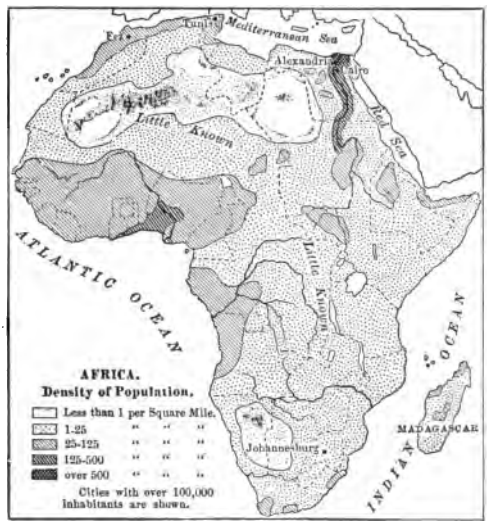


FIG. 304.

While the forest and much of the savanna have been dominated by the negro even down to the present day, the arid sections of northern Africa have been held by the whites since very early times. Near the border line between the two races there has been such a mixture of blood that the population is largely of half-breeds.

The whites of northern Africa are in part herders, living the nomadic life so characteristic of such lands. They are energetic and intelligent, though fierce and warlike. Upon

the oases are colonies of farmers, especially along the lower Nile, which is really an immense oasis in the midst of an almost trackless desert; but since the means of support are meagre, the desert itself must always be thinly inhabited.

Northern Africa figured prominently in the early history of Europe. To the ancient civilization of Egypt the early Europeans owed a part of their civilization. For those who dwelt upon the shores of the enclosed Mediterranean, after gaining knowledge of sailing, often came in contact with the Egyptians.

The Egyptian nation, once powerful and highly developed, was later conquered by the Romans, and finally fell into decay. Its prominence in olden times is indicated by the part it played in the Old Testament history. Give some examples.

FIG. 305.
Nubians of the Nile.

Although the Greeks and Romans were familiar with northern Africa near the Mediterranean, most of the remainder of the great continent was a vast unknown. Yet that such ignorance was not due entirely to distance is proved by the fact that the Mediterranean people were in communication with the more distant lands of southern Asia. It was the broad desert barrier, with its fierce nomadic inhabitants, that checked exploration by land; and the terrors of voyages on the open ocean in small boats prohibited exploration by water.

Exploration and Settlement. — The Indies, famed for their precious stones, spices, and other valuable products,

were reached by long journeys overland. But even before the famous voyage of Columbus, the Portuguese — the most progressive sailors of that day — were engaged in an attempt to reach these distant lands by sailing around the southern end of Africa. After various voyages, the Cape of Good Hope was finally passed and the way to the Indies by water was opened in 1498.

FIG. 306.

A pyramid in the desert near Cairo — one of the remarkable works of the ancient Egyptians.

The Portuguese made settlements on the east and west coasts of Africa, and they still have extensive possessions there (Fig. 297). But progress toward development and settlement has been slow for various reasons, among which perhaps the most important is the fact that so much of Africa is tropical. The desert is forbidding, and the hot, damp climate of the coastal strip, upon which colonies were naturally first established, was found particularly unhealthful (p. 417). In addition, travel into the interior was prevented by hostile hordes of blacks, and by the absence of navigable rivers. Moreover, those who were

willing to leave Europe were more attracted toward the continents of Australia and America. Why?

By far the most successful settlement in the newly discovered parts of Africa was that made by the Dutch at Cape Colony, a little later than their settlement of New York. As in the case of New York, the British seized their territory; but, by migrating northward, the Dutch people were able to maintain an independent hold upon a part of South Africa until, in 1900, their territory was once more seized by the British.

FIG. 307.
Bedouin nomads on the desert of Sahara.

During the nineteenth century Livingston, Stanley, and others entered the "dark continent"; and since their efforts, exploration has been rapid. Many European nations have taken part in the exploration, and as a result have claimed territory. But the British have been by far the most active. What other nations have possessions there? (Fig. 297).

The British have done most toward the development of Africa, partly because they control the most desirable portions, — the fertile valley of the Nile in the north, and the southern part with its favorable climate and wonderful mineral resources. They now propose to build a railway from Cape Town to Cairo, and a part of it is already completed (Fig. 297).

Northern Africa

Political Divisions. — Much of northern Africa is such a desert that its inhabitants are few and scattered. It is, however, under the control of various nations. The greater part of the Sahara is claimed by the French, though the Spanish hold a small section on the western coast, and the British control both the Libyan desert and the Egyptian Sudan in the east. Along the Mediterranean coast are several well-settled sections, the best known being Egypt. The four countries west of Egypt — Tripoli, Tunis, Algeria, and Morocco — are often called the *Barbary States* (the home of the Berbers).

Fig. 308.
Biskra, in Algeria, on the northern edge of the Sahara.

The Sahara. — From the Atlantic to the Red Sea, and from near the Mediterranean to the grass lands of the Sudan, there is almost unbroken desert — the famous Sahara. Its area is estimated to be from three to four million square miles, or about equal to that of the entire United States. It is a plateau of uneven surface, with mountain ranges here and there, and bordered on the north by the Atlas Mountains. The wind-swept highlands are bare and stony, while the lowlands have extensive areas of sand dunes.

Much of the soil is fertile, and with rainfall would yield abundant crops. But nature has forbidden rain, and its surface is therefore barren in the extreme. Only on the oases, of which there are some four hundred in the Sahara, is there the necessary drinking water which renders human life possible in the desert.

FIG. 309.
A negro hut in Zululand.

Caravans cross this desert, one of the important routes being from Tafilet in Morocco, southward to Timbukto. There may be from a thousand to fifteen hundred camels in one caravan, and a full year may be required to equip it. Each camel is carefully selected by the chief of the caravan, and many extra camels are taken along to replace those that give out on the journey. There is one driver for every dozen camels.

Upon starting, the loads are carefully packed on the camels' backs, each animal bearing about three hundred pounds. A

day's march lasts sixteen hours, the camels travelling some thirty abreast at the rate of about two miles an hour. Ordinary camels cannot travel more than three days without drinking; but the better grades are able to go for six or seven days without water and with almost no food. The trip across the Sahara, from north to south, requires fully three months. Estimate the distance. At best nearly a third of the animals perish in the round trip; and before the return journey is undertaken it is necessary for those surviving to have a rest of several weeks.

FIG. 310.

A nomad camp on the northern edge of the Sahara.

An advance party precedes the caravan to make arrangements for camping and for water. Many roundabout journeys are necessary to pass deep valleys and plateaus, for caravans go around rather than over obstacles. The daytime is hot; but as soon as the sun sets, the temperature rapidly falls and the nights become cold even in midsummer.

There are dangers in the journey aside from that of thirst. Sometimes sand storms arise; and although such a storm may not last a half-hour, it may destroy a whole caravan. The wind blows violently, and sand fills the air and drifts about in such quantities that animals and men alike are suffocated in the drifts. Also small caravans may be attacked by wander-

ing tribes of warlike natives; and near the southern edge of the desert the danger from attack by the lion is added. It evidently requires courage and great powers of endurance to engage in the caravan trade.

FIG. 311.
Sudanese people from the Egyptian Sudan.

Caravans which cross the desert carry the products of central Africa to the coast. These include ivory, skins, and ostrich feathers obtained by bartering with the negroes.

Egypt and the Neighboring British Territory. — Egypt proper and the Libyan desert are parts of the broad Sahara and have all the features of the desert just described. Even at Cairo the average yearly rainfall is but an inch and a half. In climate, both for summer and winter, northern Egypt closely resembles the desert portion of western Arizona and southeastern California.

The Nile. — The Egyptian Sudan and the country south of it, on the other hand, have a tropical climate, arid in the north, but warm and humid in the south, where the influence of the tropical rains is felt. The headwaters

of the Nile, near the equator, are fed by such heavy rains that the river is able to flow across the desert in spite of the fact that no tributaries enter the lower half of its course. How great a distance is that?

Without the Nile the whole of northern Egypt would be a sparsely inhabited desert; but the precious river waters transform the section near the Mediterranean (Fig. 313) to a great oasis which has become the seat of

FIG. 312.
Sailboats on the lower Nile.

an important agricultural industry, and is densely populated.

After leaving the region of equatorial rains and the savannas, the Nile crosses the desert through a valley — in places a thousand feet in depth — which it has cut in the plateau. In this part of its course there are several cataracts (see Fig. 297). The Nile resembles the Colorado River of the United States, which, after leaving the Rocky Mountains, flows in a deep canyon across the arid plateau of Arizona; but the canyon of the Colorado is much deeper than that of the Nile. Below Cairo the river leaves its narrow valley, divides into several channels, and flows across a plain (Fig. 313). This plain is the *delta* which the Nile has built in the Mediterranean Sea during the ages that the river has been bringing

sediment from its upper course. It is from the Nile that we have obtained the word delta, now applied to similar deposits

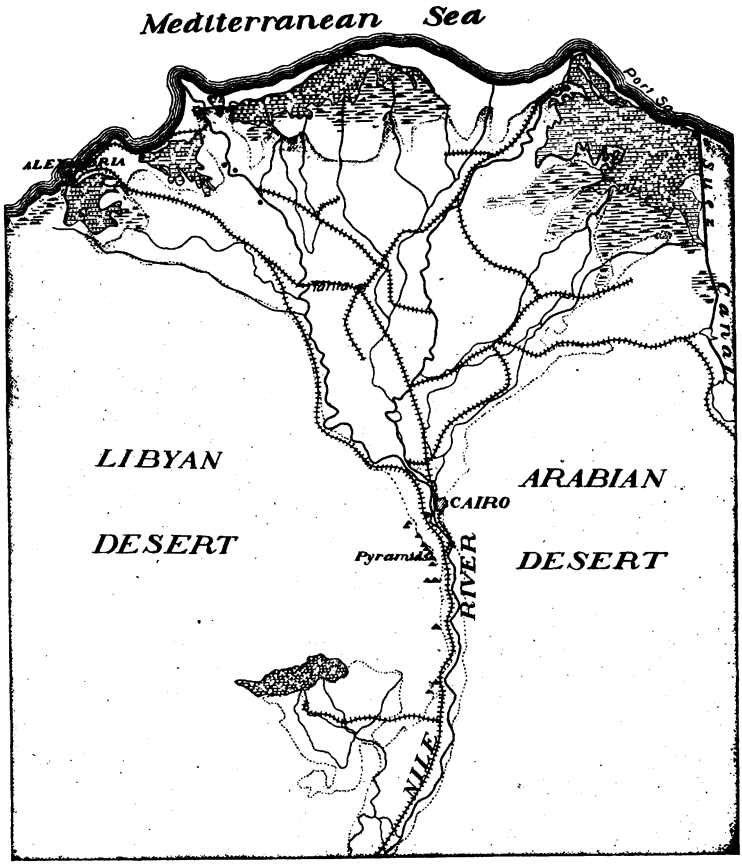


FIG. 313.

The lower Nile. The shaded area between the two deserts is farming land which is reached by water from the river. The numerous crossed lines are railways. Find the Pyramids. Why is the location at the head of a fertile delta, and at the outlet of a narrow river valley bounded by desert, a favorable one for a large city?

at the mouths of rivers in various parts of the world. The word comes from the Greek letter delta (Δ), which has the form of a triangle. Notice that shape in Figure 313.

When the rainy season comes to the Nile tributaries among the Abyssinian mountains, the river rises so high that it overflows large tracts of the broad delta below Cairo. The rise begins in June and reaches its height in

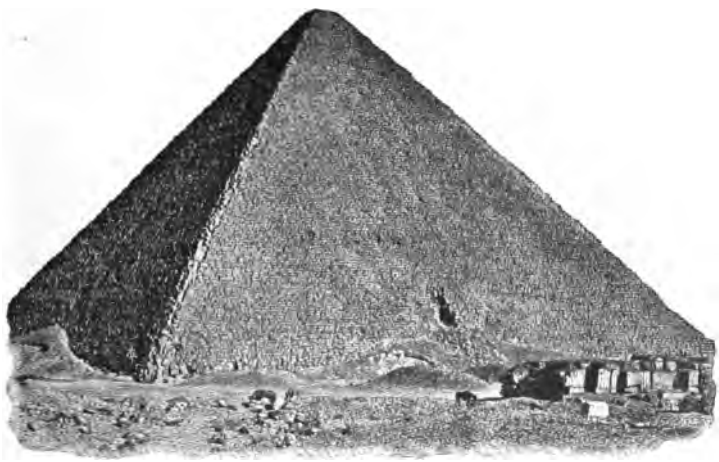


FIG. 314.
The great Pyramid of Cheops.

October. By this overflow not only is the land irrigated, but a thin layer of fine mud is spread over the fields. This serves so to fertilize the soil that, year after year, heavy crops may be raised without making the soil sterile.

Agriculture. — In consequence of these remarkably favorable conditions, the Nile delta has been occupied by an agricultural people from the very earliest times. It is still the seat of a great grain industry, producing

wheat, corn, millet, and barley. Much rice and sugar cane are also raised, and cotton which is of especial value because of its long fibre. There are many vineyards, and orange, lemon, and fig groves; and both along the Nile and on the oases of the desert there are groves of

FIG. 315.
The Sphinx and two of the Pyramids.

date palms (Fig. 306). Grazing is of importance in the Nile Valley, and on the neighboring plateau. The animals raised include the buffalo and camel in addition to sheep, goats, cattle, horses, and donkeys.

The People. — The known history of Egypt reaches back several thousand years before the time of Christ. The fertile soil and favorable climate, added to the protection from frequent wars which the surrounding desert

and sea afforded, encouraged the development of industry and thrift. By the mixture of agricultural and pastoral races there arose a civilization in advance of that of the neighboring sections of Europe and Asia. In fact, at the time when Europe was inhabited by barbarians, and the peoples of western Asia were unorganized, Egypt had made long advances in civilization.

FIG. 316.
An obelisk in Egypt.

We read in the Bible of the Pharaohs who ruled over Egypt. Can you recall any of the Bible stories which relate to these rulers; for example, the story of Joseph? During those times the Egyptians built the obelisks (Fig. 316), the sphinx (Fig. 315), and those marvellous structures, the pyramids (Figs. 306 and 314), which are really the tombs of kings. By a peculiar process they preserved the bodies of their dead, and these *mummies* may be seen in the museums of many large cities. Among the mummies are the remains of the Pharaohs themselves.

FIG. 317.
An Arab woman in Cairo.

In the movement westward of the people

FIG. 318.
An Egyptian sheik, a descendant of Mohammed.

who dwelt along the eastern shores of the Mediterranean and farther east in Asia, Egypt became one of the highways of the world, and against its people many destructive wars were waged. As other nations have advanced, the Egyptians have steadily lost ground. The famous conqueror, Alexander the Great, overcame them and founded the city of Alexandria; later the Romans made conquest of the territory; and repeatedly since then the country has been invaded, for it has continued to be a highway of trade for three continents. At present Egypt is required to pay annual tribute to Turkey, but she is otherwise practically independent of Turkey; and the ruler, or *Khedive*, is a hereditary monarch. The government of Egypt was so bad that the French and British finally stepped in and took control of the finances of the nation. When the French declined to aid in subduing a

FIG. 319.
A Fellah woman and child.

rebellion in Egypt, the British alone assumed a large share in the control of Egyptian affairs.

The great majority of the Egyptians are Mohammedans (Fig. 318), but they are divided into several classes. The most numerous class is that of the *fellahs* (Fig. 319), or peasants, who live along the Nile and are apparently descendants of the ancient Egyptian farmers. In the towns most of the business is in the hands of the *Copts*, who are the rem-

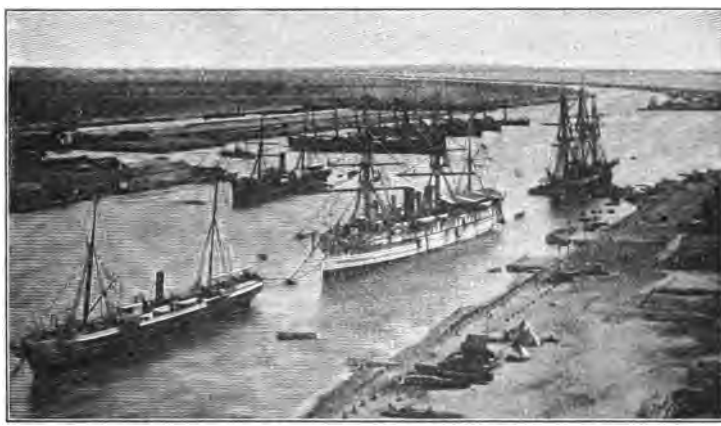


FIG. 320.
The Suez Canal at Port Said.

nants of the ruling classes of ancient Egypt. They are still Christians in spite of centuries of oppression by the Mohammedans. A third class is that of the Arabs, among whom are the nomadic *Bedouins* (Fig. 307) who dwell in the desert.

As a result of British direction there has recently been marked progress in Egypt. Extensive irrigation works have been undertaken, and the land area for cotton and sugar cane has thereby been greatly increased. By means of reservoirs and canals it is further proposed to reclaim

thousands of square miles of the desert. A number of railway lines has also been built (Fig. 313), including a part of the proposed line from Cairo to Cape Town (p. 426). Outside of the Nile Valley, however, travel still depends largely upon the use of camels (Fig. 306).

FIG. 321.
A view of a part of Cairo.

Suez Canal. — Northeastern Egypt includes the Isthmus of Suez, which connects Africa with Asia. This narrow neck of land has for centuries stood as a barrier to water travel from Europe to southeastern Asia, compelling European vessels to pass all the way around Africa in order to reach southern Asia. Little wonder is it, therefore, that a ship canal has been built there.

FIG. 322.
One of the mosques in Cairo.

The Suez Canal, begun in 1859, was completed in 1869. It extends from SUEZ to PORT SAID (Fig. 297), and is eighty-seven miles long, with a depth of twenty-six feet and a width at the surface varying from sixty-five to one hundred and twenty yards. Its length is much greater than that of the proposed Panama Canal, but the difficulties of construction were less. The country is very level, and, as in the case of the proposed Nicaraguan Canal, a part of the

course (about twenty-one miles) is through a lake. Ten vessels on the average pass through the Suez Canal each day. Estimate the distance saved by this canal in going from London to Calcutta. By agreement among nations it cannot be captured and closed in time of war.

FIG. 323.
An Arab school in the streets of Cairo.

Cities. — At the head of the delta, just above the point where the Nile branches (Fig. 313), is CAIRO, the capital and largest city of Egypt and, in fact, of all Africa. It is about the size of St. Louis, having a population of 570,000. This interesting place is visited each year by a stream of tourists, some seeking a winter health resort, others attracted by the strange life of the country and the remarkable ruins of the old civilization (Figs. 314–316).

Cairo itself contains the palace of the Khedive, several interesting mosques (Fig. 322), and a museum in which are preserved many Egyptian antiquities and works of art. The inhabitants also attract attention, for in the streets may be seen many people with different languages and peculiar customs. The differences among the people may be illustrated by the following fact: there are three Sabbaths each week,

Friday, the Sabbath of the Mohammedans, Saturday, observed by the Jews, and Sunday, by the Christians.

ALEXANDRIA, connected with Cairo by rail (Fig. 313), is the seaport of Egypt and the second city in size in the country. The harbor, which is a very busy place, is protected by a sea wall nearly two miles in length. The chief business is the export of cotton, sugar, grain, and other Egyptian products, and the importation of manufactured goods. More than half the trade is with Great Britain.

FIG. 324.
The costume of women in Algeria.

The Barbary States. — Find the position of each of these four countries. Each borders the Mediterranean, but extends southward into the desert (p. 427).

The Atlas Mountains skirt the Mediterranean coast from the Atlantic to Tunis, where their projection into the Mediterranean forms the most northerly point in Africa. These mountains contain many valuable mineral products, including precious metals in Morocco and Algeria, and marble and alabaster in the latter country. These mineral resources, however, have been but slightly developed.

Since the Atlas Mountains cause vapor to be condensed when winds blow from the ocean or from the Mediterranean, many of the valleys are well watered. Forests cover some of the mountain slopes, and one of the valuable trees is the cork oak, the bark of which is removed for

shipment from Algeria to Spain and Portugal. Camels, sheep, goats, and cattle are raised among the mountains and upon the plateaus. In the season of rainfall — our winter — they are driven to the plains on the borders of the desert.

Agriculture is carried on here and there, often by means of irrigation, with water supplied by the mountain snows and rains, as in southern California. The villages are therefore situated where valleys open to the plains. Among the crops produced, besides dates and grains, are figs, grapes, and olives. Wine from the grapes of Algeria is shipped in large quantities to France; and the best olive oil and the best dates in the world come from Tunis.

FIG. 325.
A scene in Morocco, on the edge of the Sahara.

The original occupants of this region, the *Berbers*, still dwell on the desert and among the mountains, having been driven there long ago by invading Arabs. Most of the inhabitants are Mohammedans. Tripoli is still a Turkish province, but Tunis and Algeria are held by France. However, the native ruler, or *Bey*, of Tunis is permitted to direct affairs in his country under the supervision of

France. Morocco is the only one of the Barbary States that maintains independence, being ruled by an absolute monarch, or *Sultan*. Can you suggest why the conflicting interests of Spain, France, and England should prevent conquest by any one?

Many of the inhabitants of Morocco are still barbarians, and some of the tribes among the mountains even refuse to recognize the rule of the Sultan. On the whole the people are cruel and treacherous, and if a vessel is wrecked upon their coast, it is sure to be plundered by them. Only within the last hundred years have they been obliged to abandon their custom of seizing Christians and holding them for ransom.

FIG. 326.
A street in the "Old Town" of Algiers.

Conditions of life in Morocco are shown by the following: The writer once visited a school in Tangier consisting of a dozen boys from nine to ten years of age. The room where they studied received its only light from the open door, and it contained no seats, desks, or furniture of any kind. The children sat on the floor in a semi-circle around a long-bearded old man, who likewise sat on the floor, and the only object they had before them was a page from the Koran, or Mohammedan Bible. What does such a condition of education indicate in regard to progress? If this is the case on the coast, almost within the shadow of Europe, what must be the condition farther inland?

Almost the only manufacturing in these states is hand work. Beautiful silk and woollen goods are made, and also articles of

leather. Most of these articles are intended for their own use; but because of the beauty of the work some are exported.

These countries are only partially developed. Caravan trade, herding, and agriculture are the chief occupations. Excepting in northern Algeria and Tunis, there are no railways and few roads. In fact, in many parts the only way to travel is on horseback or on camels, along paths worn by the sheep and goats. Even agriculture is carried on in the most primitive fashion, some of the methods employed being those of two thousand years ago.

FIG. 327.
Church of Notre Dame in Algiers.

The houses are made of stone and sun-dried brick (Fig. 325), with thick walls to keep out the heat of summer. They are commonly low and one storied, although some of the larger buildings are interesting and even beautiful (Fig. 327). Much the same style of architecture was introduced into the New World by the early Spaniards, who were taught it by the Moors when they invaded Spain from northern Africa.

The capitals are the principal cities among the Barbary States. FEZ, one of the capitals of Morocco, is in the interior; but the Sultan and his court do not reside there all the year. Name the other capital. TANGIER, on the

coast, is better known. Why should it be? In Algeria the seaport ALGIERS is the capital and largest city. It is an interesting place, combining many features of ancient and modern times. Under the French it has become an important trading centre. The same is true of TUNIS,

FIG. 328.
A view of the plateau of South Africa. A Zulu village in the foreground.

the capital of the country by that name. Locate the capital of Tripoli.

SOUTHERN AFRICA

Comparison with Northern Africa. — In some important respects there is a resemblance between northern and southern Africa, although they lie in different hemispheres. What similarities are there in climate (p. 419) and physi-

ography (p. 415)? There is a resemblance, too, in the fact that both sections have long been settled by white men. What difference is there in the length of occupation by white men?

The People. — It is to the Dutch that we owe the first important development of South Africa. Settling at Cape Town, and then spreading over the neighboring

FIG. 329.

A Zulu woman making a straw mat.

region, they took possession of the country occupied by the negroes and introduced the European industries of farming and ranching.

When Cape Colony came into possession of the British (p. 426), many of the Dutch remained; but others emigrated, or "trekked," northward and found new homes in the interior. There they established two republics, the Transvaal and the Orange Free State, in which they desired to continue the customs of their forefathers and live in the pursuit of agriculture and herding.

Doubtless the *Boers*, as these people are called, would have been left to themselves but for the discovery of wonderfully rich deposits of gold. The mines were developed by British capital, and friction arose between the mine owners and the Boers. War followed, as a result of which the Transvaal and the Orange Free State were declared British colonies in 1900.

FIG. 330.
A pineapple field in South Africa.

At present, therefore, the British control a broad strip from the southern tip of Africa northward to the southern end of Lake Tanganyika. What are the names of the British colonies in South Africa (Fig. 297)? What nations control the land to the east and west of the British possessions? Besides the Boers there are many British in South Africa, especially in Cape Colony and at the gold mines of the Transvaal. There are also large numbers of negroes in this region, particularly in the tropical section and in Zululand in northern Natal (Fig. 303). Some of them, like the Zulus, have fiercely opposed the encroachment of the whites and still maintain semi-independent states. They are, however, making progress toward civilization.

Agriculture and Grazing. — Along the east coast, and in some of the interior valleys, agriculture is an important industry. Sugar, bananas, pineapples, tea, coffee,

and rice are raised near the coast, where the climate is warm and damp. But wheat, tobacco, vegetables, and grapes are produced in the cooler south, and upon the uplands wherever the rainfall is sufficient or irrigation possible.

By far the greater part of South Africa is an arid plateau (Fig. 328), whose elevation causes cold winters

FIG. 331.
Cattle in the Transvaal.

in spite of the latitude. Forests are absent, and little wood is found excepting that which comes from the thorny acacia bushes of the plains and the willows and other trees that grow along the streams. Excepting in the real desert, the grass springs into life after the summer rains (November and December), and the country becomes green and beautiful. Then follows a long drought, when the vegetation withers. But, as in the

arid part of western United States, the dried grass is a sort of natural hay upon which cattle and sheep thrive.

Upon this plateau, therefore, immense numbers of cattle, sheep, and goats are raised, and also many ostriches. It is estimated that in Cape Colony alone there are over eighteen million sheep and goats, one million cattle, and two hundred and fifty thousand ostriches. In consequence, the production of wool, hides, meat, and ostrich feathers is of great importance. Of what value are these products to Great Britain?

Mineral Wealth. — The discovery of gold in South Africa has brought great changes, as among the mountains in the arid section of western United States. This metal is found scattered through a conglomerate rock in the Transvaal, near the city of JOHANNESBURG, which on that account has become the largest city of South Africa. This district has become the most important in gold production in the world; in 1898 more gold was mined here than in the entire United States.

Other valuable minerals, including copper, iron, and coal, also occur; but as yet they have been little developed. At KIMBERLEY in Cape Colony, however, are diamond mines, which now supply ninety-eight per cent of all diamonds.

The diamonds occur as rounded crystals in a decomposed volcanic rock, and are obtained by digging out the soft rock (Fig. 332) and carefully removing the crystals. After this the crystals must be cut into the proper shape and polished. There are various grades, some clear and beautiful, others impure and dull. So productive is this deposit of precious stones that $160,000,000 worth have been removed in eleven years. There is only a limited demand for diamonds; but the

company in control is careful not to mine enough of them to reduce the price greatly. This is possible since the Kimberley mine owners have a practical monopoly of the diamond production of the world.

Commerce and Cities. — The two chief rivers of South Africa are of little use as trade routes. The Orange River

FIG. 332.
A diamond mine at Kimberley.

is not navigable, because of lack of water and the presence of rapids at the edge of the plateau. The other, the Zambezi, is navigable by small boats for a distance of three hundred miles from its mouth; but the climate near the coast, especially on the delta, is warm and unhealthful. Rapid water checks further navigation, and

at one point there is a cataract, the Victoria Falls (see map, Fig. 297), which rivals even Niagara in grandeur. This cataract has a width of over a mile and a height of four hundred and fifty feet. It is therefore both wider and higher than Niagara; but the volume of water is less.

Nor is the coast especially favorable to commerce. For long distances there are no good harbors, while the river

FIG. 333.
Cape Town with Table Mountain (3500 feet high) in the distance.

mouths are choked with sand bars which render entrance difficult. A breakwater has made Table Bay a good port, and around its shores, beautifully situated at the base of Table Mountain (Fig. 333), is CAPE TOWN, the capital and largest city of Cape Colony. It is connected with the interior by a railway line, the southern end of the proposed railway from Cape Town to Cairo.

A second important harbor is that of Delagoa Bay, upon which is situated LOURENÇO MARQUEZ, the capital of Portuguese East Africa. Being connected by rail with the interior, this port has been much used for the shipment of Transvaal products. Notice how much nearer it is to Johannesburg from this point than from Cape Town. DURBAN, the seaport of Natal, is a small city also connected with the Transvaal by rail. The two principal interior cities are KIMBERLEY and JOHANNESBURG (p. 448). There is no important town in

FIG. 334.

A scene at the market in Kimberley. Oxen are extensively used by the Boers as draught-animals.

German South Africa, which is for the most part an arid plateau. To what nation does *Walfisch Bay* belong?

CENTRAL AFRICA

This vast area is in large part a great unknown. Much of it is tropical forest; but on the northern and southern sides are open savannas (p. 418).

The Rivers. — Owing to the heavy rainfall of the forest belt, the rivers are large. The Nile and Zambezi, already

described, and the Niger and Kongo, all receive water from the equatorial rains. The Niger is navigable in sections; but there are rapids in some parts, and in its northern portion the river dwindles in size because of the dry climate. Its large tributary, the Benue, is navigable.

It is the immense Kongo, which empties into the sea a few degrees south of the equator, that offers the best

FIG. 335.
A steamer on the Kongo.

means of entrance to Central Africa. Although it is interrupted by a series of falls a short distance from the coast, above Stanley Pool there are thousands of miles of navigable waters in the main river and its tributaries.

It was Stanley who first explored the Kongo, in 1876; and since that time this part of Africa has been rapidly developing. Formerly it was necessary to carry goods around the rapids, each native porter carrying about sixty pounds. Only in this way was Stanley able to carry his boats to the navigable portion farther up stream. Now, however, a railway two hundred and fifty miles in length connects the lower Kongo with Leo-

poldville on Stanley Pool above the falls. From there, at all seasons of the year, steamers may go a thousand miles up the river and also into many tributaries.

Resources. — Half a century ago the most important industry in tropical Africa was trade in negro slaves, obtained by means of war, by raids, or by purchase from the chiefs, and sold to slave dealers to be shipped abroad. Now the shipment of plant and animal products takes the place of the slave trade. But there is still much slave-trading among Africans themselves.

On the forest edge and in the savannas elephants are still hunted for the valuable ivory of their tusks. The forests yield rubber; the dried meat of the cocoanut is exported as copra; and there are valuable gums, spices, and tropical woods. Agriculture and grazing are also carried on, though few of the products are exported. So little is known about this region that no one can tell what valuable minerals may exist there.

The People. — Very few Europeans have settled in Central Africa, and the native blacks live almost as their ancestors did. Contact with civilization, however, has caused some changes, as the introduction of firearms and some slight improvements in the methods of farming. Most of the inhabitants live in ingeniously built huts clustered in villages. They have a kind of tribal government, each tribe having a leader whose power is absolute, and under whom are minor chiefs. Some of the tribes are cannibals. In religion they vary greatly, though all are intensely superstitious (p. 91).

Among the blacks none are more remarkable than the *pygmies* whom Stanley discovered in the equatorial forest, where large numbers live in an area of about thirty thousand square

miles. The adults are only three or four feet in height. They live exclusively by hunting, by gathering the vegetable products of the forest, and by theft from the neighboring agricultural tribes. Their villages are usually built in the forest where two paths cross, and the huts are shaped like a turtle's back, being about four and a half feet high, ten feet long, and

FIG. 336.
A scene in tropical Africa, on the bank of the Kongo.

five or six feet wide. In that hot climate they find need for but little clothing.

With a small spear, a short bow with poisoned arrows, and a knife, they hunt with wonderful skill, and by means of pitfalls they capture even the elephant. They know the forest intimately, and neither bird nor beast can escape them. According to Stanley they offer one of the greatest obstacles to exploration; for they appear stealthily, attack a party with great courage, and then disappear in the trackless woods.

Divisions of Central Africa. — European nations have been active in claiming the greater part of Central Africa; but their control over the native inhabitants is merely nominal, and the boundaries of the different sections are not well defined. We shall study briefly some of the more important divisions.

The Sudan includes the vast area between the Sahara and the tropical forest. What can you tell about its climate? (p. 418). More than half of the Sudan is claimed by the French, and most of the remainder, including the *Niger Territories* and the *Egyptian Sudan* (p. 430), is held by the British. The inhabitants are nomadic in the north, and agricultural in the south, though they raise little more than is needed for their own use. There is some gold in the west; but the principal products are ivory, ostrich feathers, and gums.

The Sudan is difficult of access, being bordered by the Sahara on the north, the tropical forest on the south, and the plateau edge on the east, west, and southwest. Water routes are of little service, since some of the drainage is into interior basins, like Lake Chad, and some into the Nile and Niger, which are interrupted by rapids. The difficulty of reaching TIMBUKTO, for example, is shown by the fact that there is still an important caravan route from that place across the wide Sahara to the Mediterranean (p. 428). A railway from Timbukto to the sea is now under consideration. What influence would it probably have on this caravan route? Why?

East of the Sudan is *Abyssinia*, which is for the most part a rocky plateau crossed by mountains and difficult of access. Its condition is indicated by the fact that the capital is periodically changed when the supply of firewood is exhausted. It is evident, therefore, that there are not many fine government buildings. The inhabitants are mainly whites belonging to very different tribes which are often hostile to one another. Many of the people

still hold to Christianity notwithstanding the invasion by Mohammedans nearly four centuries ago. In 1889 Italy laid claim to the whole of Abyssinia; but in 1896 King Menelik destroyed the Italian army, and the Italian claim was withdrawn. Italy still holds *Eritrea* and *Italian Somaliland.* What other nations occupy a part of the coast on the border of Abyssinia?

The map shows several small countries on the west coast of Africa in the part marked *Upper Guinea.* Find *Lower Guinea.* The divisions colored pink belong to the British; those marked green to the Germans. Find a section belonging to Spain.

One of the divisions of Upper Guinea is *Liberia*, which is of special interest to Americans. It is a negro republic established by Americans as a home for freed slaves, and its capital, MONROVIA, is named after President Monroe. No white man is permitted to become a citizen. Besides uncivilized negroes in the interior, the republic includes fully twenty thousand negroes with some knowledge of civilization, all living near the coast. The coastal strip is damp and unhealthful; but back of it is the forest-covered plateau slope. The products are chiefly coffee, palm oil, and sugar. It was the example set by the British in founding *Sierra Leone* as a home for liberated slaves, that led to the establishment of the republic of Liberia.

Kongo State, crossed by the equator and drained by the Kongo and its tributaries, was founded by the king of Belgium, who supported Stanley in his explorations of this region. It is in large part a forest-covered plateau; but there are sections of grass land. Hordes of savages, including the pygmies, inhabit the forests and savannas; the buffalo, elephant, and leopard live in the rivers; and the roar of the lion is frequently heard.

Through the building of the railway around the cataract of the Kongo, and by the aid of steamers above and below

the falls, the resources of this great area are beginning to be drawn upon. From it are obtained large quantities of ivory, rubber, palm-oil, gum, and pepper, as well as tropical woods.

East of the Kongo State are British and German territories. What are they called? What is their climate? What products would you expect? Observe to what extent the British claim Africa. What break is there in the British territory between the Cape of Good Hope and the Mediterranean? What variety of climate does the British territory include?

FIG. 337.
A scene in tropical Africa.

Need of Railways. — One of the great needs of Central Africa is railways for transportation to and from the sea. The three large lakes, Nyassa, Tanganyika, and Victoria Nyanza, are of great service in the transportation of goods, and already there are steamers upon them. Elsewhere

caravans of native porters bear the products on their backs, travelling along narrow paths through the forest. The difficulties and expense of such transport are great.

With British and German energy we may expect that railways will soon reach to various parts of the interior of Africa; in fact, a railway to Victoria Nyanza is already well under way (Fig. 297). With such railways even tropical Africa, during the present century, promises to be opened up to development and settlement.

Islands near Africa

The large island of *Madagascar* is two hundred and thirty miles from the mainland. It has an area of about two hundred and twenty-eight thousand square miles, and is, therefore, much larger than any of our states excepting Texas. There is much highland in the country, especially on the eastern side; but the coastal region is lowland. The island is controlled by the French, and produces cattle, hides, valuable tropical woods, rubber, and coffee. While there are some Arabs, and tribes of negro origin in the west, the natives are for the most part Malays, called *Hovas*, who came by water from the northeast.

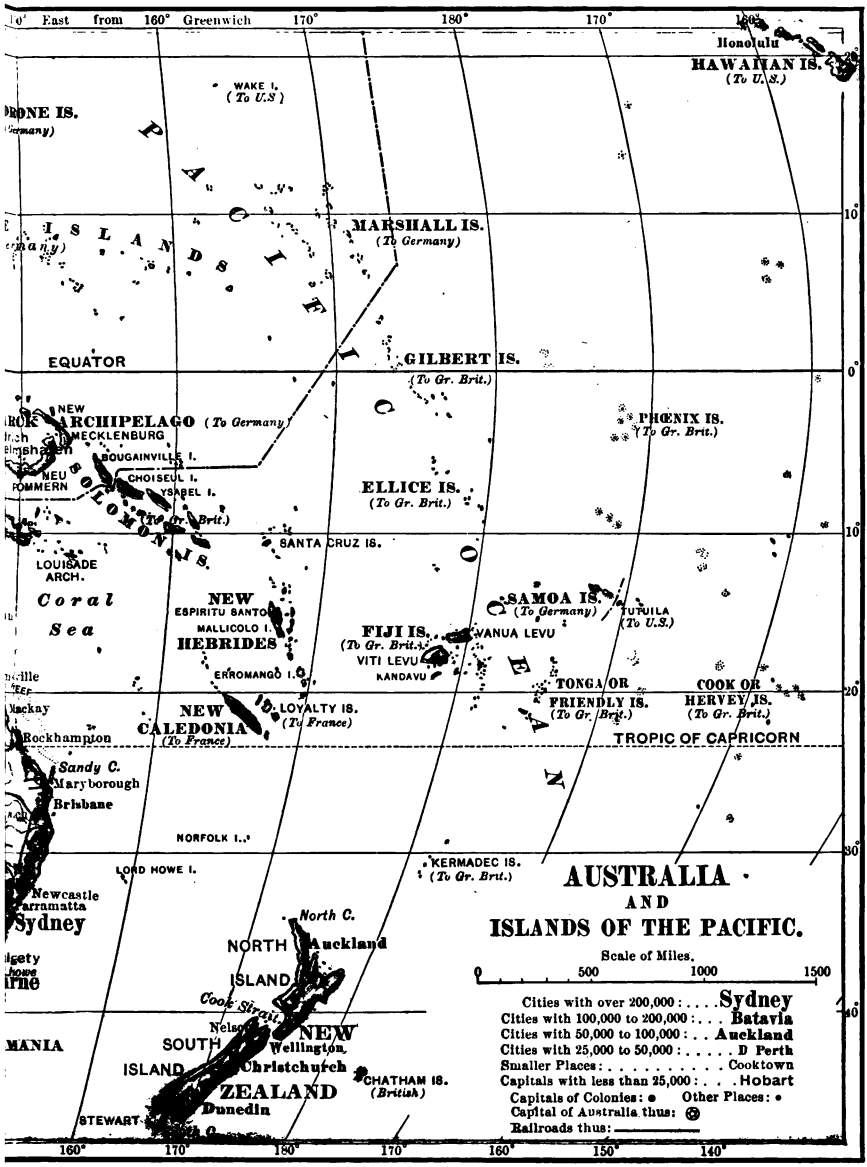
Of the many small islands near the coast of Africa the northernmost are the *Madeira Islands* on the west side. These, together with the *Cape Verde Islands* farther southwest, have belonged to Portugal since the early Portuguese voyages of discovery. The Spanish *Canary Islands* lie between these two groups. Find other islands along the west coast (Fig. 297) which belong to Spain and Portugal.

Ascension Island and *St. Helena*, south of the equator, are, like the above-named groups, volcanic. They belong to Great Britain, and St. Helena attained notoriety as the prison home of Napoleon Bonaparte. The principal small islands on the eastern side of Africa are *Zanzibar* (British) near the coast, and *Reunion* (French) and *Mauritius* (British) east of Madagascar. Locate each of these (Fig. 297). Find other French and British islands. These islands are of value as naval stations. Their inhabitants are engaged in fishing and in agriculture, raising sugar cane and other tropical products.

REVIEW QUESTIONS.— (1) What is the shape of Africa? (2) Compare the coast of Africa with that of other continents. (3) Tell about the highlands; the rivers and lakes. (4) Describe the belts of climate, and compare them with those of South America. (5) Describe the plant and animal life and compare it with such life in Asia. (6) Tell about: (*a*) the negroes; (*b*) the nomads; (*c*) the whites in the north. (7) Tell about explorations and settlements by (*a*) Portuguese; (*b*) Dutch; (*c*) British. (8) What have been some of the principal obstacles to such explorations and settlements? (9) Name and locate the Barbary States. (10) What portions of northern Africa are under the control of European countries? (11) Describe the Sahara. (12) Describe the caravan trip. (13) Tell about Egypt: the climate; the Nile River; agriculture; people and government; Suez Canal; principal cities. (14) Describe the Barbary States: their raw products; manufactures; commerce; inhabitants; government. (15) State resemblances between northern and southern Africa. (16) Tell about South Africa: the people; agriculture and grazing; mining. (17) What about the value of the Orange and Zambesi rivers for commerce? (18) Locate and tell about each of the cities: (*a*) Cape Town; (*b*) Lourenço Marquez; (*c*) Durban; (*d*) Kimberley; (*e*) Johannesburg. (19) Tell about Central Africa: the climate and rivers; the resources; the people and their customs. (20) Name and locate the principal divisions of Central Africa. (21) Tell about: (*a*) the Sudan; (*b*) Abyssinia; (*c*) Somaliland; (*d*) Liberia; (*e*) Sierra Leone; (*f*) Kongo State. (22) What about the need of railways? (23) Name the principal islands near Africa and give some facts in regard to them. (24) Name the principal possessions of the British in Africa (Fig. 297). (25) Name the possessions of other European countries.

REVIEW AND COMPARISON. — (1) Give several reasons why Africa has been explored and settled so much later than either North or South America. (2) What rivers of North America resemble those of Africa in having rapids and falls that interfere with commerce? (3) Contrast the Mississippi River with the Nile. Make a drawing of each, showing the principal tributaries and towns. (4) Compare the Kongo with the Missouri in length; with the Amazon (Appendix II.). (5) Compare the area of Lake Victoria Nyanza with that of Lake Superior (Appendix II.). (6) Is Africa on the whole as well adapted to agriculture as is South America? Give your reasons. (7) Make a sketch map of the Atlantic and compare the position of Africa with that of South America. What part of America is in the same latitude as the Sahara? (8) Cape Horn is how much farther south than Cape of Good Hope? (9) Why is not a large part of northern South America a desert, like northern Africa? (10) Compare southern Africa with southern South America in products and importance. Why the difference?

SUGGESTIONS. — (1) What per cent of the present population of the United States belongs to the negro race? (2) How do the negroes compare with the Indians in their willingness and ability to adopt civilized customs? (3) Read the Bible story of Joseph in Egypt. (4) Read the story of Moses. (5) Find out some facts about the Pyramids. (6) Why is England especially benefited by the Suez Canal? (7) What obstacles are in the way of building railways across the Sahara to take the place of caravans? (8) Read about our short war with Tripoli in 1804. (9) Why was the southern point of Africa called the Cape of Good Hope? (10) Examine a diamond to see how it has been cut. (11) Find out something about missionary work in Africa. (12) What reasons can you give for sending missionaries there? (13) Find out about the peculiar animal life upon the island of Madagascar. (14) Compare Madagascar with Cuba in regard to latitude, area, products, and people. (15) Find some facts about Livingston, Mungo Park, Stanley, and other African explorers. (16) Read one of the books of these explorers. You will find Du Chaillu's books on Africa very interesting. (17) Who were Bartholomew Diaz and Vasco Da Gama, and what part did they take in the discovery of the water route to India? (18) Find out about Krüger and the British war with the Boers in 1900.

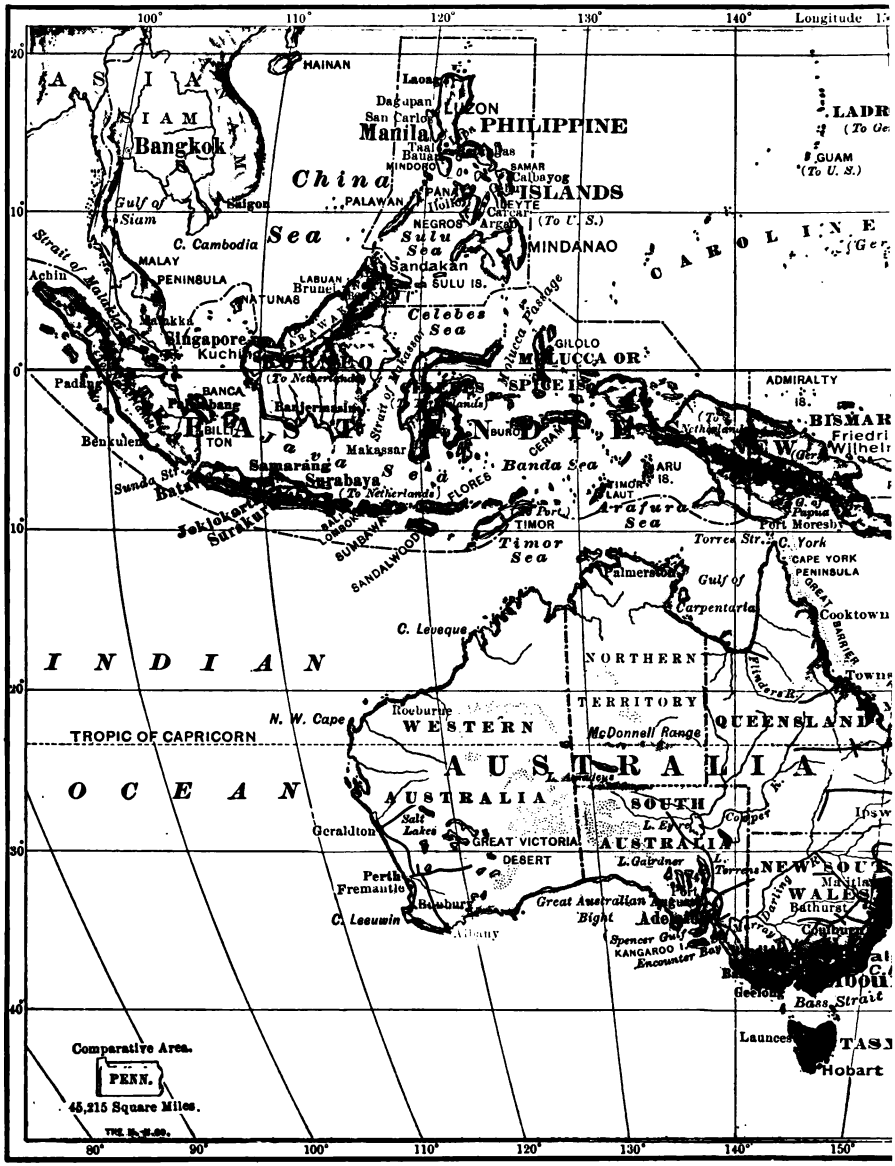


AUSTRALIA AND ISLANDS OF THE PACIFIC.

Scale of Miles.

0 500 1000 1500

Cities with over 200,000 : . . . . Sydney
Cities with 100,000 to 200,000 : . . . Batavia
Cities with 50,000 to 100,000 : . . Auckland
Cities with 25,000 to 50,000 : . . . . . D Perth
Smaller Places : . . . . . Cooktown
Capitals with less than 25,000 : . . . Hobart
Capitals of Colonies : ● Other Places : •
Capital of Australia thus: ⊛
Railroads thus: ——



Longitude
ASIA
SIAM
Bangkok
Gulf of Siam
Saigon
C. Cambodia
China Sea
HAINAN
Laoag
Dagupan
San Carlos
LUZON
Manila
PHILIPPINE ISLANDS
Taal
Batan
MINDORO
SAMAR
Calbayog
PANAY
PALAWAN
Iloilo
BEYTE
Carcar
Argao
NEGROS
(To U. S.)
Sulu Sea
MINDANAO
Sandakan
SULU IS.
LABUAN
Brunei
NATUNAS
Strait of Malakka
Achin
MALAY PENINSULA
Malakka
Singapore
Kuching
Celebes Sea
Molucca Passage
GILOLO
MOLUCCA OR SPICE IS.
Padang
BANCA
Palembang
BILLITON
Benkulen
Banjermasin
Strait of Makassar
Makassar
BURO
CERAM
Banda Sea
ARU IS.
TIMOR LAUT
Arafura Sea
Sunda Str.
Batavia
Samarang
Surabaya
(To Netherlands)
Jokjokarta
Surakarta
BALI
LOMBOK
SUMBAWA
SANDALWOOD
FLORES
Port
TIMOR
Timor Sea
Torres Str.
C. York
CAPE YORK PENINSULA
Palmerston
Gulf of Carpentaria
Cooktown
GREAT BARRIER
C. Leveque
INDIAN OCEAN
NORTHERN TERRITORY
Flinders R.
Towns
N. W. Cape
Roeburne
WESTERN AUSTRALIA
McDonnell Range
QUEENSLAND
TROPIC OF CAPRICORN
L. Amadeus
SOUTH AUSTRALIA
Salt Lakes
Geraldton
GREAT VICTORIA DESERT
L. Eyre
Cooper
L. Gairdner
L. Torrens
Perth
Fremantle
Bunbury
C. Leeuwin
Albany
Great Australian Bight
Adelaide
Spencer Gulf
KANGAROO I.
Encounter Bay
Darling
Murray
NEW SOUTH WALES
Bathurst
Coulburn
Geelong
Bass Strait
Launces
TASM
Hobart
Comparative Area.
PENN.
45,215 Square Miles.
80°
90°
100°
110°
120°
130°
140°
150°
20°
10°
0°
10°
20°
30°
40°

FIG.

XXIII. AUSTRALIA AND ISLAND GROUPS

MAP QUESTIONS (Fig. 338). — (1) Judging from the railways and cities, which is the best-settled part of Australia? (2) Which part is least settled? (3) What reasons can you suggest for these facts? (4) From the lakes and rivers what do you infer concerning the climate of the interior? (5) How does Tasmania compare in area with Pennsylvania? (Appendix II.). With your own state? (6) Make the same comparison for New Zealand. (7) Make a sketch of Australia to show the location of the several divisions.

(8) Make a list of the island groups belonging to the United States; to Great Britain; Germany; the Netherlands; France. (9) Which country owns the greatest number? (10) What nations claim parts of Borneo? New Guinea? (11) Find the area of each of these islands (Appendix II.) and compare it with the area of your own state. (12) What must be the temperature and rainfall conditions in these islands? (13) What, then, about their products?

AUSTRALIA

Physiography. — Australia lies apart from the rest of the world, an island continent in the water hemisphere and the only continent wholly in the southern hemisphere. Isolated for ages, its plants and animals differ (Fig. 344) from those in other parts of the earth (p. 66). With its area of nearly three million square miles, it approaches the United States or Europe in size. But it has been settled by Europeans so recently, and so much of its surface is desert (Fig. 338), that it is much less densely populated than the other continents. Much of the interior is practically unexplored, partly because of the desert and partly because of the absence of interior navigable waters.

The surface, like that of Ireland, suggests a plate in form, since the low interior rises gradually to plateaus

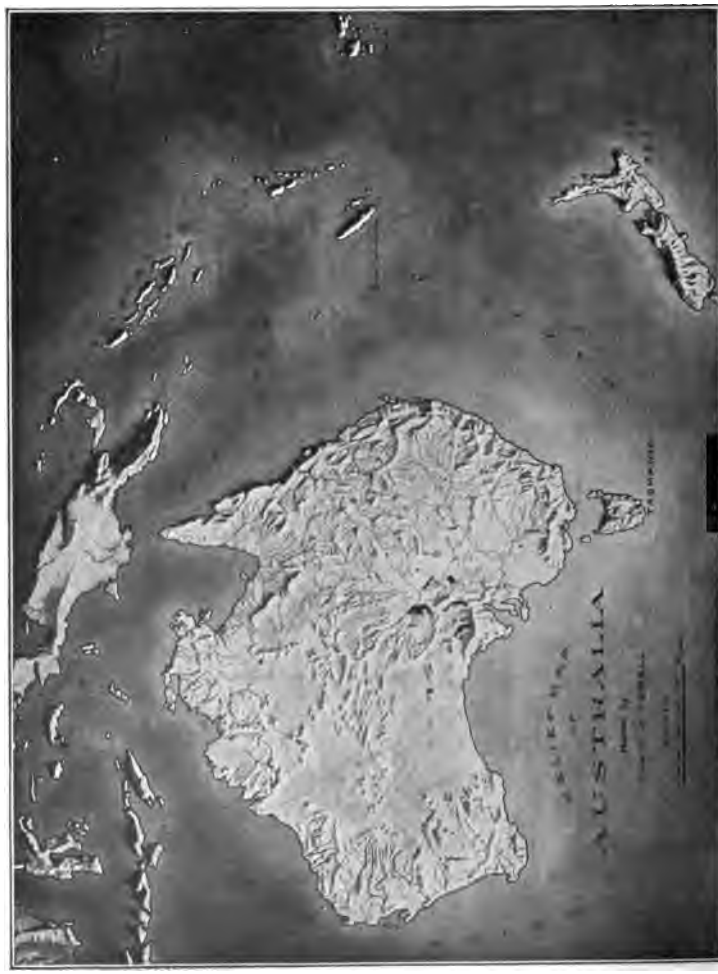


Fig. 339.

and mountains which often descend steeply toward the sea. While there are some low, short ranges in the interior, the highest land is in the east, where the mountains run parallel to the coast. In the southeast some of the peaks reach a height of over a mile.

The mountains of eastern Australia, like the Appalachians of North America, are the worn-down remains of an ancient mountain system. Still further like the Appalachians, they served to check the extension of early settlements inland. Tasmania is really a continuation of the eastern highland, as Newfoundland is a continuation of the mountains of eastern North America.

The streams which flow eastward to the Pacific, cascade down the mountains in short courses. Of the others in eastern Australia some end in the lakes of interior basins, and some evaporate in the dry climate; but many unite with the Darling and Murray rivers, which are at times navigable for long distances. During the dry summer season, however, all excepting the Murray may dwindle to mere chains of water holes. A wave-built bar at the mouth of the Murray closes it to ocean steamers, so that, unlike the Mississippi, no large cities have grown up along its banks.

The coast line of Australia is so regular that for long distances there are no good harbors; but the sinking of the land in the southeastern part has caused some excellent ports.

Off the northeastern coast is the *Great Barrier Reef*, the longest coral reef in the world. This has been built by coral animals, which still thrive there in great numbers. A few openings allow ships to enter the quiet channel between the reef and the land; but navigation is not easy, and only an experienced pilot can avoid the dangerous shoals. Small sail-

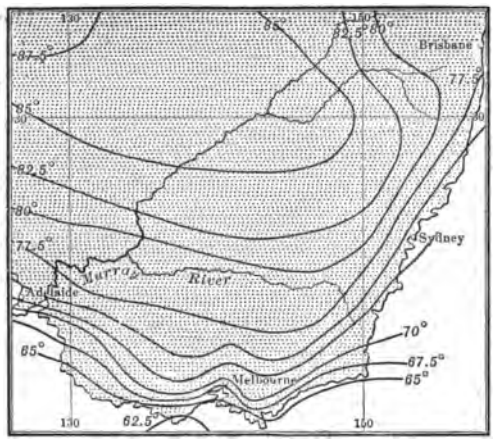


FIG. 340.

January isotherms for southeastern Australia — mid-summer for that hemisphere.

boats carrying divers and their assistants, usually Malays, are engaged on this reef and the northern shores of Australia in fishing for pearls, pearl shell, and other products of tropical waters.

Climate. — Since Australia lies within the belt of the south-east trade winds, the eastern highland has an abundant rainfall on its seaward side and is clothed with dense forests. After crossing the mountains, however, the winds are so dry that the forest gradually disappears, changing first to open, park-like wood-

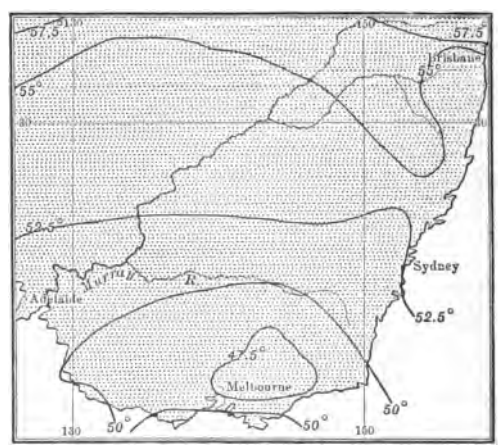


FIG. 341.

July isotherms for southeastern Australia — mid-winter for that hemisphere.

lands, then to grass-covered uplands, and finally to desert lowlands, still partly unexplored. The low interior mountain ranges cause only a slight rainfall which supplies the salt lakes of the interior.

During the southern winter the interior becomes cold, and the heavy air presses outward toward the coast as cold land winds; but during the summer the dry interior is so intensely heated that monsoon winds blow from the northeast and bring equatorial rain to the northern coasts. In this section are found areas of tropical forest. Southwestern Australia and Tasmania are reached by the prevailing westerlies, with their cyclonic storms, which bring variable weather and rainfall, as in eastern United States. These rainy sections are also clothed with forests.

FIG. 342.
Eucalyptus forest in Australia.

It is therefore only along portions of the coast that there is enough rainfall for agriculture, while the interior, and much the greater part of the continent, is either arid or actual desert. Much of the interior is adapted to ranch-

ing, though some parts are even too arid for that; but the southeastern coast, whose equable climate reminds us of the Mediterranean, will support a dense population.

Plants and Animals. — Australian vegetation is not only peculiar, but also strikingly adapted to the climate of the country. In the interior, as in other desert regions, grass and flowering plants have gained the power to make rapid growth and to mature their seeds quickly, so that a few days after a rain the barren sands become carpeted with green as if by magic.

FIG. 343.
Undergrowth in the Australian forest.

Among the desert grasses, one of the most remarkable is the porcupine grass which grows on the sandy plains of the northwest interior, and is so hard, wiry, and spiny as to prevent passage through it. Plants with leaves which taste of salt also thrive here, being fitted for growth on plains that are too arid and alkaline for grass. These "salt bushes" are so valuable as forage for sheep and cattle that they are now introduced into the arid section of southwestern United States.

The scrub trees that flourish in the arid interior have developed a foliage able to resist evaporation. For example, the gum trees (Eucalyptus) hold their narrow leaf blades vertically with only the edges toward the sun's rays; the leaves of wattles (Acacia) and other plants have shrunk to thorns; and some trees secrete odorous oils which check evaporation. The leaves are too tough and leathery to wilt, and their dull greens give a sombre tone to the scattered woods. In these interior forests, which the settlers call "scrub," the thorny acacia and

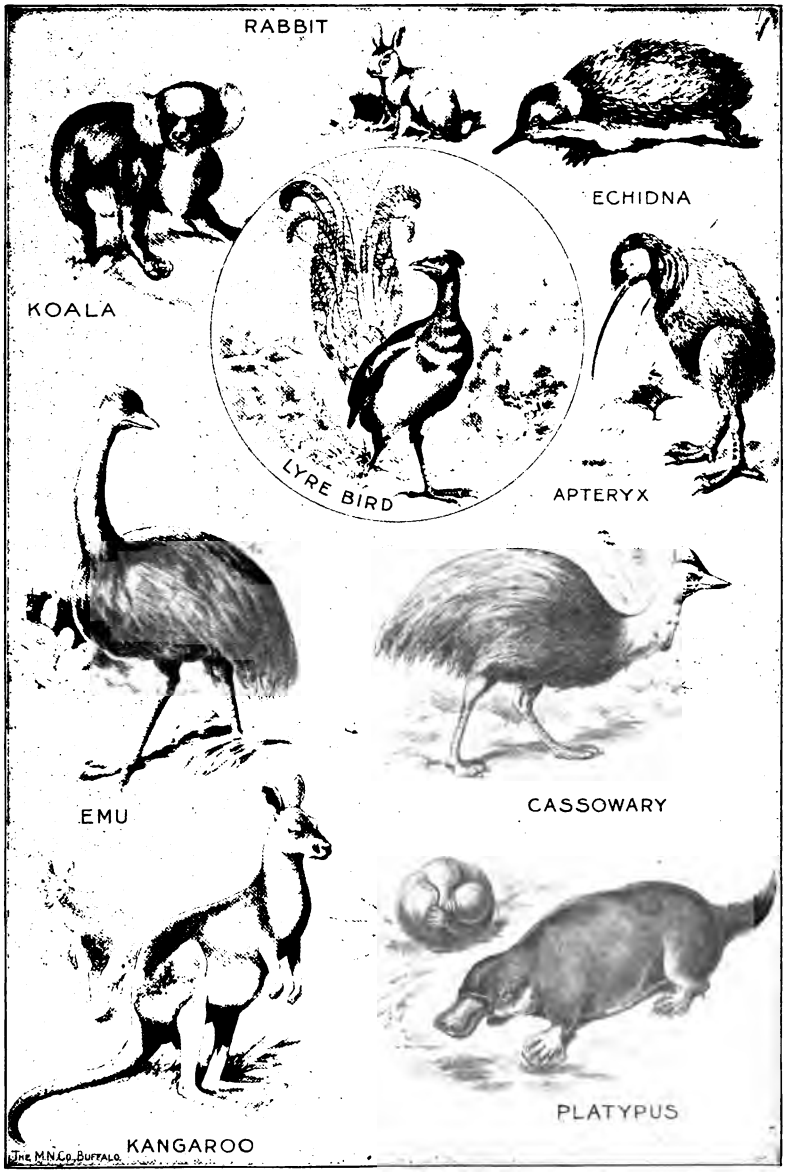


FIG. 344.

Some Australian animals. The platypus lays eggs like a bird or reptile. The kangaroo, like other marsupials, carries its unprotected young in a pouch. Where else have we found large running birds like the emu?

the close-set stems of the gum — rising to a height of a dozen feet — form a thicket through which a lost traveller may wander until death relieves his thirst.

On the equable rainy slopes near the coast some of the gum trees are giants, in some cases four hundred feet in height. They rival the "Big Trees" of California, which also thrive where damp winds blow from the ocean. The undergrowth of the forest, which is almost tropical in character, includes tree ferns, palms, and orchids. These dense woods are called the "bush."

We have already seen (p. 66) that the Australian animals are peculiar (Fig. 344). Describe some of them. State the reasons for their difference from animals of other continents.

FIG. 345.
An Australian savage.
(See also Fig. 55.)

History — When discovered, Australia was sparsely settled by blacks allied to the negroes of Africa, but differing from them in many respects. Of these savages it is estimated that about seventy thousand remain, of whom about a third still wander in the wild interior, scantily clad (Fig. 345), building the rudest of shelters, and gaining their living by hunting. They still use that peculiar weapon, the *boomerang* (Fig. 346), which, when properly thrown, will fly in curves and even return to the thrower.

Although for a long time it had been known that there was an Australian continent, settlements were not made there until 1788. Neither the country nor the products

were tempting to the early Spanish and Dutch explorers, and those nations colonized other lands of greater promise. It was not until the famous English navigator, Captain Cook, led an expedition to this southern continent that the fertile southeastern coast was discovered.

For a while the distant land was used as a regular penal station to relieve the crowded condition of English jails, and naturally free settlers came to the country slowly. But their number gradually increased, and, after long agitation, the transportation of criminals was stopped.

FIG. 346.
Australian boomerangs.

Almost at the same time that gold was discovered in California it was also found in southeastern Australia, and tens of thousands of people rushed there to wash the sands for the precious metal. Since the miners needed supplies, many of the settlers turned their attention to other industries, especially agriculture and grazing. Therefore in Australia, as in California, the gold mines led quickly to the development of the country's resources.

New South Wales, as the first colony was called, finally grew so large, and the settlements were so scattered, that it became difficult to control it under a single government. Consequently Tasmania, Victoria, and Queensland were successively set off as separate colonies. South Australia and West Australia, however, were settled as distinct colonies. The several divisions were at first controlled by military governors sent from England; but as the country became better developed, the colonies were granted more freedom, although still receiving governors from England.

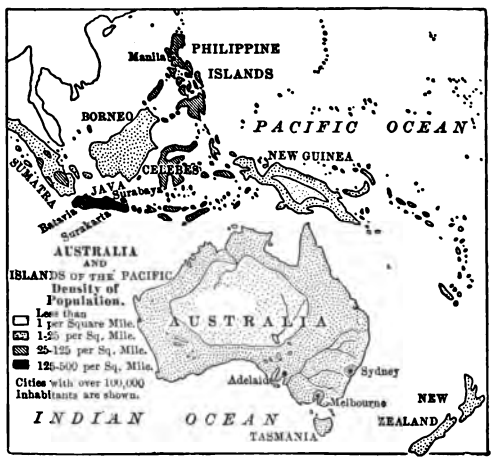


FIG. 347.

Density of population in Australia and neighboring islands.

The colonies prospered under such popular government, each with its own laws, some having free trade, some imposing tariffs on goods imported from other colonies. Common interests, however, early awakened a desire for union; and finally, on January 1, 1901, they were united to form the *Commonwealth of Australia*. This new commonwealth has a government similar to that of Canada, and is independent of England in all matters excepting those which affect the British Empire as a whole. The

population, which equals that of the United States when her Constitution was adopted, is rapidly growing.

Nearly all the Australian settlers have come from the British Isles, and the unity of the race has led to a peaceful growth. As in England, education has been encouraged, church schools now being replaced by practically free, compulsory education in public schools. There are colleges at the capitals, and two important universities. The English love of outdoor sports is fully maintained, and great skill is naturally developed in a climate where it is possible to practise cricket, football, tennis, and rowing all the year round.

Sheep Raising. — Although it was gold that brought population to Australia, her greatest wealth lies in her flocks of Merino sheep. Australian wool is the finest in the world. Sheep were first known in Asia, where doubtless they were originally wild animals; and the ancestors of the Merino were such as those tended by Jacob. From Asia the breed spread along the Mediterranean and found in Spain a favorable, dry climate. From this point flocks were taken to the early Dutch colony of South Africa and thence to Australia. The Merino sheep had for centuries been carefully tended in Europe and separated from coarse-wooled varieties; and when it was found that

FIG. 348.
The last Tasmanian, a race now entirely extinct.

the climate and natural herbage of Australia really improved the quality of their wool, the English demand for that product led to a rapid development of the sheep-raising industry. It has now spread to the newly discovered pastures west of the mountains.

In the early days of Australia the flocks were reared upon the unfenced government land, as in western United States. The sheep were driven to pasture and water, and cared for at night by lonely shepherds, much as in the days of David. But now the land is largely fenced with wire, each sheep station having its own "*run*" or ranch. The largest ranches contain fully a hundred thousand sheep, and employ men enough to make a little village, with a store, a church, and a school. As in Argentina, each run is divided into sections, or "*paddocks*," by wire fencing, so that the sheep of different ages and conditions may be separated. The mildness of the climate makes it unnecessary to provide winter protection for the animals, and now that the wild dogs have been exterminated, the sheep no longer need much care from shepherds.

When warm weather begins, the sheep are gathered to the shearing sheds. Bands of skilled shearers go through the country, some starting in Queensland and following the season southward from station to station. With deft use of clippers, they remove the fleece from a sheep in a few minutes. The fleeces are then carried by boys to sorting tables, where the wool is assorted according to quality and made ready for pressing into bales for shipment. Formerly lines of wagons, laden with wool, toiled down to the seaports and brought back a yearly supply of food and clothing; but now railways and steamers aid in transportation, and small towns have developed as trade centres.

During most of the year life at a sheep station is monotonous. At times horsemen run down the emu (Fig. 344) for sport, or hunt kangaroos with dogs. Since their introduction from Europe rabbits have so increased as to be a great pest because

of the grass that they eat, and thousands of miles of rabbit-proof fence have been built to exclude them from good pasture land. Their rapid increase is due to the absence of natural enemies in this far-away continent.

Animal Products. — To-day grazing is the characteristic and most important occupation in Australia. There are

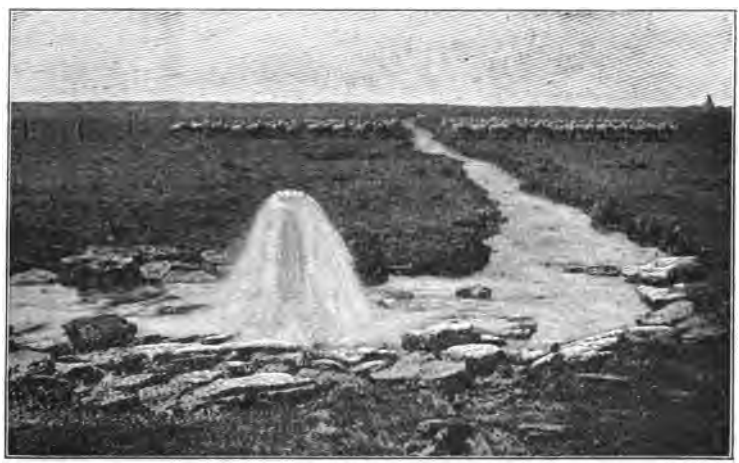


FIG. 349.

A sheep run in Australia. The water in this artesian well rises from a layer of porous rock over six hundred feet below the surface.

over a hundred million sheep, and fully half the exports consist of wool; but frozen or canned mutton and beef, together with tallow and hides, are also sent to England. Horses are bred for export, and cattle and swine are raised in large numbers. While the sheep graze in the arid interior, cattle are more numerous in the districts where there is heavier rain. Many cattle, especially near the coast, are raised for their dairy products, and butter is exported to England. At the season when the cows of

Belgium and Denmark are stalled because of the cold, the dairy herds of New South Wales are feeding on fresh pastures. Explain the causes of the difference.

Farming. — Since agriculture secures a larger return from the soil than grazing, sheep have been driven from the damp lowlands and from those portions of the plateaus where the rainfall is sufficient for crops. Even in the interior there is farming where irrigation is found possible. In some cases water is supplied from streams; in others, from artesian wells (Fig. 349). Such wells are possible in a number of places where water exists in layers of porous rock beneath the parched plains. Upon boring to these layers, the water gushes forth for use.

Wheat is the most important crop aside from hay, and enough is raised to place Australia twelfth among lands raising this grain.

The farm products are distributed according to climate. For example, while oats and other hardy grains increase southward to Tasmania — since cold increases in that direction — corn is important only from New South Wales northward. There are large sugar plantations on the warm coast of Queensland; and in western Australia, where there are gold mines in the arid interior, much hay is raised for the animals employed at the mines.

As in our Pacific states, fruits are an important product. They range from tropical varieties on the northern coast to oranges and other warm temperate fruits southward, and finally, in the highlands and in Tasmania, to the orchard and small fruits of the cool temperate lands. In Victoria and South Australia, vineyards for the production of wine are of importance. Some of this fruit raising is carried on by the aid of irrigation, as for instance in the Murray River Valley, where the water is supplied by the melting snows of the mountains. In what months would the snows melt there?

Mining. — The gold of Australia, like that of California, was first obtained from the gravels, and mines were later opened along the veins in the mountain rocks. Unlike the condition in western United States, however, absence of water has prevented hydraulic mining on a large scale. Gold mining is still of great importance, Australia ranking second among gold-producing nations (Fig. 418). New deposits are discovered as the country is explored, the recent development of western Australia being largely due to such discoveries.

FIG. 350.
A gold mine in Australia.

Copper mining greatly aided in the early development of South Australia, and rich copper mines are now worked in Tasmania. Silver and tin are other important mineral products. Coal is well distributed and of good quality. The best-developed field is near the coast of New South Wales, and some coal is exported. Rich iron ores, together with limestone, are found associated with these coal fields, and the mining and working of iron will follow with the growth of the country.

Manufacturing. — Some wool is manufactured into cloth; some leather is tanned and made into shoes; and much flour is made from the wheat. There are sawmills and

planing mills; and other forms of simple manufacturing are carried on. But for the most part the raw products of Australia are shipped abroad to be manufactured. Most of these products go to England, and the commonwealth depends upon the mother country for most of its manufactured articles. Australia is passing from the pastoral to the agricultural

FIG. 351.
Sydney harbor.

stage of her development, and the stage of extensive manufactures is yet to come.

Cities. — Australian cities have grown very rapidly, and one-third of the people live in the capitals of the six colonies. Favored as the seats of government and as seaports, and connected with the interior by government railways, these capitals have become the leading commercial centres. They are characterized by fine government buildings, and by abundant provision of parks and gardens for the people. Their large suburbs afford homes for the workingmen and save them from the crowded life in tenement houses.

MELBOURNE, the largest city in Australia and the capi-

tal of Victoria, is beautifully situated at the head of a broad harbor. SYDNEY, the capital of New South Wales, founded in 1788, and, therefore, the oldest city of Australia, is noted for its fine harbor (Figs. 351 and 352). At this point the coast faces deep water for a hundred miles; it consists of coves alternating with headlands

FIG. 352.
A view of a part of Sydney.

and is dotted with fine residences set in park-like grounds. Both of these cities rank among the great seaports of the British Empire. ADELAIDE is a third large city. Of which division is it the capital? Name the other capitals.

Since nine-tenths of the Australians live on the coast lands, much of the commerce is carried on by means of steamboats, and most of the cities are seaports connected by rail with the interior farms, mines, and sheep country. A few mining centres, like BALLARAT and BENDIGO in Victoria, have become large towns. Ballarat owes its growth partly to its trade as the centre of a fine farming and grazing country.

Island Groups

New Zealand. — More than a thousand miles southeast of Australia are the two large, mountainous islands of New Zealand. In the South Island there are great glaciers among the mountains, while in the North Island there are active volcanoes, and also hot springs and geysers, like those of the Yellowstone National Park.

Since these islands lie in the course of the stormy westerlies, there is heavy rainfall on the western slopes. Therefore the mountains are clothed with forests of pine and other trees, with many kinds of ferns and tree-ferns beneath. On the lee or eastern slopes the rainfall is less, and the land is covered with wiry grasses.

In the south the crops are those of the cool temperate belt; but in the north the climate is mild enough for oranges. Can you suggest how ocean currents may influence the temperature of the north and south? (Fig. 38). What effect must the presence of water on all sides have upon the temperature?

New Zealand is so distant from other lands that few of the larger animals, excepting birds, have ever reached the islands. The native people, or *Maoris*, who must have come to the islands in boats, were a hardy, warlike race, living in protected villages, amidst cultivated fields. Their opposition to newcomers delayed settlement by the English until a half-century after the founding of Sydney. They are now overpowered, and those that survive live mostly in the interior of the North Island. Many have so fully adopted civilized ways that they are allowed representatives in the legislature.

As in Australia, pastoral industries take the lead. There are twenty million sheep, and frozen mutton and

wool are exported to England. Cattle are likewise kept, and butter is exported. Agriculture is important, especially in the districts of fertile volcanic soils on the North Island; but much land that is suited to farming has never been cleared of forest. There are both gold and coal mines among the mountains; and from their slopes are obtained valuable timber and a gum used for varnishes.

FIG. 353.
A view in New Zealand.

Manufacturing is only slightly developed, and is chiefly for home use.

Although the industries and life of this English colony resemble those in Australia, its interests are so different that they have prevented its joining the Australian federation — just as the island colony of Newfoundland has declined to join the Dominion of Canada. The situation of these islands in the temperate zone is favorable to rapid progress; and the vigorous immigrants from the British Isles have developed the resources wonderfully, and have established one of the best governments in the world.

Many short lines of railway connect the settled interior with the seaports; roads and stage lines extend to the more distant districts; and steamers ply around the coasts and to distant countries. There are four prominent cities of nearly the same size, the smallest of which is WELLINGTON, the capital, and the largest, AUCKLAND, about as large as Duluth in Minnesota.

The East Indies. — Between Asia and Australia are hundreds of islands, some very large, others so small that they find no place on our map. Of these the great majority have animals, plants, and people of Asiatic origin. New Guinea, however, which is nearest to Australia, bears a resemblance not to Asia but to Australia. It is, therefore, usually considered a part of Australasia, while the islands to the west and northwest are classed with Asia.

New Guinea, north of Australia, is one of the largest islands in the world, having an area equal to Texas and Pennsylvania combined. Although three times the size of New Zealand, it contains a smaller population, composed mainly of savages. This difference is due to its position in the torrid zone. The heavy tropical rainfall has clothed most of its surface with dense forests, so that the high mountain ranges and the unhealthful lowlands (Figs. 66 and 67) of the interior are almost unknown.

While the islands farther west are overrun with Malays from Asia, the natives of New Guinea are Papuans (Fig. 60), resembling the native Australians. The animal life also resembles that of Australia, indicating that this island, like Australia, has long been separated from Asia. Former connection with Australia is further indicated by the fact that the two are now separated only by a shallow sea.

The three nations that claim New Guinea maintain only trading stations on the coast; and the tropical forests, the fertile soils, and the minerals remain to be utilized in the future.

The other islands have also a tropical climate, and are clothed with dense forests in which the elephant and rhinoceros, as well as other Asiatic animals, are still found. Most of the natives are Mohammedan Malays from Asia, but some of them are pagans.

The *Philippine Islands*, which belong to the United States, are really a northern extension of the East Indies. What can you tell about them? (p. 516).

Most of the other islands of this region, including Sumatra, Java, the Celebes, and a large part of Borneo and New Guinea, are *Dutch colonies*. What nation controls the island of Timor? To which nation does northern Borneo belong? Borneo, with a greater area than all the New England and Middle Atlantic states together, is one of the largest islands in the world. The immense size of these islands is indicated by the fact that Sumatra is larger than California, while Java has a greater area than New York State.

All of the larger islands are mountainous; in fact, they are parts of mountain ranges rising out of the sea, and among them are many active volcanoes, some of which have had terribly destructive eruptions. There are lowlands near the coasts, and many coral reefs skirting them. Indeed, a large number of the smaller islands are merely coral reefs slightly elevated above the ocean.

Since they are so near the equator, and therefore have a heavy rainfall, these islands have tropical products. The forests supply valuable woods and gums, including gutta-

percha and camphor. Large areas, especially in Java, are highly cultivated and produce quantities of rice, sugar cane, and coffee. In the production of the last two articles Java is one of the leading regions of the world (Figs. 427 and 428). Among the noted products of the East Indies are spices, such as pepper, cloves, and nutmegs; in fact, one of the island groups is known as the Spice Islands. What is the other name? There are also valuable minerals, including tin, gold, and precious stones; and from the sea are obtained beautiful pearls and pearl shells.

FIG. 354.
A native house in the Friendly (Tonga) Islands.

The Dutch have been remarkably successful in managing their East Indian colonies, which are a source of great wealth; yet the larger islands are so mountainous, and the forests so dense, that great areas are scarcely known. The Dutch East Indies are fifty times as large as the Netherlands and have seven times as many inhabitants, or nearly half as many as in the United States.

The largest city among these islands is MANILA, in the Philippines; and next in size is BATAVIA, the centre of the Dutch colonial government.

Islands of the Pacific. — The map (Fig. 338) shows the western Pacific dotted with island groups; but these islands are so small that, although there are many hundreds of them, their

combined areas are little more than half that of New Zealand. They are the higher peaks of great mountain folds rising from the ocean floor. Many of them are volcanoes, others submerged peaks upon which corals have grown and formed coral islands.

What names among them have you heard before? To what nations do the groups belong? Although under the control of these foreign nations, the local government is usually administered by native chiefs.

FIG. 355.
A native village in the Fiji Islands.

Together these islands have a population of less than a million; but the natives have been decreasing in numbers, partly because of drunkenness and disease following contact with Europeans. Although missionaries have converted many to Christianity, others remain savages, and some even practise cannibalism. They are the best sailors of all the natural races, and in past centuries reached the islands in boats from Asia, going from group to group.

There is a marked difference between life on the "low," or coral, and that on the "high," or volcanic, islands. Volcanic islands, like Fiji, whose peaks rise several thousand feet, are heavily forested on their rainy, windward slopes; and their fertile soil encourages agriculture. Thus the coffee plantations of New Caledonia and the sugar plantations of Fiji recall the

products of the volcanic Hawaiian Islands. As in Hawaii, also, bananas and pineapples are raised for home consumption and for export.

On the low coral islands, on the other hand, the cocoa palm is the mainstay of human life, supplying food, clothing, shelter, boats, many utensils, and the means of trade as well. *Copra*, the main export from Samoa and from many of the Pacific islands, is the dried meat of the cocoanut, of value for its oil and as food. There is, of course, little mineral wealth in the volcanic and coral islands; but in some of the islands, where mountain folds reach the surface, there are mineral deposits, such as the nickel found in New Caledonia. Among the coral reefs beautiful pearls are found.

REVIEW QUESTIONS. — *Australia.* (1) What about its position, area, and population? (2) Where are the mountains? (3) What resemblance is there to North America? (4) How do the streams vary in the several sections? (5) What is the nature of the coast? (6) Tell about the Great Barrier Reef. (7) How does the rainfall vary in the different parts of Australia? Give the reasons. (8) What differences in plant life are thus caused? (9) What is the influence on industries? (10) Mention some of the ways in which the plants are adapted to their surroundings. (11) Tell about the forests. (12) What about Australian animals? (13) Tell about the natives. (14) Give reasons why Australia was not settled earlier. (15) What finally led to rapid settlement and development? (16) Tell about the government: early condition; union of colonies; present condition. (17) Tell about sheep raising: the Merino sheep; introduction to Australia; development of industry; care of the sheep; shearing; transportation of wool; life on a sheep run. (18) What are the animal products? (19) Tell about farming: water for irrigation; principal products; variation in crops according to climate. (20) What mineral products are found? (21) What is the condition of manufacturing? (22) Why are the capitals so important? (23) Name and locate the three largest cities; what can you tell about each? (24) What about other towns?

Island Groups. (25) Tell about New Zealand: its surface features; climate; native animals and people; leading industries; development; cities. (26) Tell about New Guinea: size; position; climate; people; animals; resemblance to Australia; resources. (27) What

about the animals, plants, and people of the East Indies? (28) To what nations do the islands belong? (29) What about their size? (30) Tell about their physiography, climate, and products. (31) What about the success of the Dutch in the East Indies and the extent of their possessions there? (32) Tell about the small island groups: their names; position; origin; government; people; products.

COMPARISONS. — (1) Australia resembles South Africa in its surface, climate, occupations, and products. State how this is true. (2) Australia also resembles western United States in climate, in occupation and products, and in the order of development of her resources. Describe these points of resemblance. (3) In what respects does southern South America (Chile and Argentina) resemble Australia? (4) What differences are there in climate due to difference in form of the two land masses? (5) What differences in the present condition of development due to the history and the races of each? (6) What part of Australia has the same latitude, in the southern hemisphere, that southern Florida has in the northern? (7) Which of our states most nearly equals New Zealand in area? (8) What peninsula of Europe resembles New Zealand in shape? How do the two countries compare in area? In population? (9) What advantages over Australia has the United States enjoyed in that it has attracted settlers from so many different nations? (10) What part of South America most resembles the East Indies in climate and products? Make the same comparison for North America.

SUGGESTIONS. — (1) If it were within your power, how would you arrange the highlands of Australia so as to secure the most even distribution of rain? (2) Estimate the greatest length of New Zealand. (3) Estimate the distance from Batavia to Manila. (4) Write your impression of the climate of Melbourne in January; in July. (5) Through some fruit dealer obtain a cocoanut in its husk and examine it. (6) Read Whittier's poem on the Palm Tree. (7) Learn something about the work of missionaries in the small Pacific islands. (8) Collect pictures for the school, showing the islands and their life. (9) By what routes can one go from New York City to Australia? Through what waters? Which would be the shortest? About how many miles? (10) Answer the same questions for a voyage from New York to Manila. (11) Read in Tarr's "Elementary Geology" (pp. 251–256) about the origin of atolls. (12) Read about the eruption of Krakatoa (same book, p. 343) in the Sunda Strait, near Batavia.

FIG. 356.

Relief map of North America.

(Modelled by E. E. Howell.)

NORTH AMERICA
Scale of Miles.
0 500 1000
Capitals: ⊙ Other Cities: •
Comparative Area
PENN.
45,215 Square Miles.
ASIA
ARCTIC OCEAN
GREENLAND
(To Denmark)
Baffin Bay
Davis Strait
BAFFIN LAND
ARCTIC ARCHIPELAGO
ARCTIC CIRCLE
Hudson Bay
LABRADOR
NEWFOUNDLAND
St. Johns
C. Race
NOVA SCOTIA
Halifax
Boston
New York
Philadelphia
Baltimore
Washington
C. Hatteras
BERMUDA IS. (Br.)
ATLANTIC OCEAN
PACIFIC OCEAN
ALASKA
DOMINION OF CANADA
UNITED STATES
MEXICO
Bering Sea
Nome
Yukon
Dawson
Great Bear Lake
Great Slave Lake
L. Athabaska
Lake Winnipeg
Winnipeg
Quebec
Montreal
Ottawa
The Great Lakes
Chicago
St. Louis
New Orleans
Galveston
Sitka
QUEEN CHARLOTTE IS
VANCOUVER IS
Victoria
Columbia R.
Cape Mendocino
San Francisco
Great Salt Lake
Colorado R.
Rio Grande
Sierra Madre
Mississippi R.
Missouri R.
Red R.
Arkansas R.
Ohio R.
Appalachians
FLORIDA
C. Sable
BAHAMA (Br.) ISLANDS
WEST INDIES
GREATER ANTILLES
LESSER ANTILLES
PORTO RICO (To U.S.)
JAMAICA (Br.)
Havana
Gulf of Mexico
YUCATAN PENINSULA
Vera Cruz
Acapulco
C. San Lucas
TROPIC OF CANCER
Caribbean Sea
CENTRAL AMERICA
Lake Nicaragua
Colon
Panama
PANAMA CANAL
ISTHMUS OF PANAMA
SOUTH AMERICA
PRIBILOF IS.
KODIAK I.
120° 110° 100° Longitude West 90° from Greenwich 80° 70°
THE M-N. CO

FIG. 357.

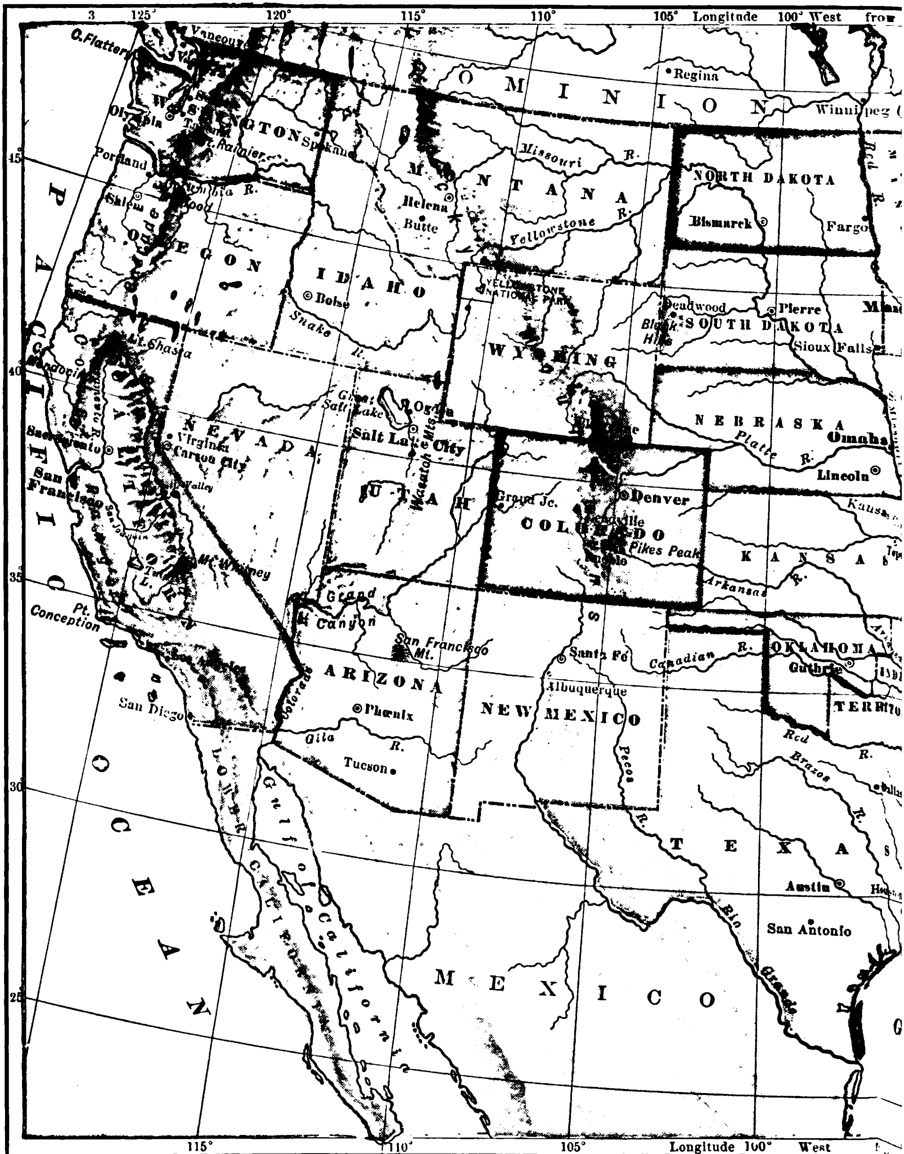

Longitude West from
Regina
DOMINION
Winnipeg
Vancouver
C. Flattery
Olympia
WASHINGTON
Spokane
Portland
Columbia R.
Salem
OREGON
MONTANA
Missouri R.
Helena
Butte
Yellowstone R.
NORTH DAKOTA
Bismarck
Fargo
IDAHO
Boise
Snake R.
YELLOWSTONE NATIONAL PARK
WYOMING
Deadwood
Pierre
SOUTH DAKOTA
Black Hills
Sioux Falls
Mt. Shasta
Great Salt Lake
Ogden
Salt Lake City
NEVADA
Virginia
Carson City
Sacramento
San Francisco
NEBRASKA
Platte R.
Omaha
Lincoln
UTAH
Wasatch Mts.
Grand Jc.
COLORADO
Denver
Leadville
Pikes Peak
Pueblo
Kansas
KANSAS
Arkansas R.
Mt. Whitney
Pt. Conception
Grand Canyon
San Francisco Mt.
Santa Fe
Canadian R.
OKLAHOMA
Guthrie
ARIZONA
Phoenix
Gila R.
Tucson
Colorado
San Diego
Albuquerque
NEW MEXICO
Pecos R.
Red R.
Brazos R.
TEXAS
Austin
San Antonio
Rio Grande
PACIFIC OCEAN
Gulf of California
MEXICO
Longitude West

FIG. 358.

95° Greenwich
90°
85°
80°
75°
70°
65°
C A N A D A
Lake of the Woods
L. Superior
Duluth
Sault Ste. Marie
L. Huron
L. Michigan
Ottawa
Montreal
Quebec
St. Lawrence
Fredericton
MAINE
Augusta
Portland
Concord
Boston
C. Cod
Providence
Newport
New York
St. Paul
Minneapolis
WISCONSIN
Milwaukee
Madison
Grand Rapids
Lansing
Detroit
Toronto
L. Ontario
Rochester
Albany
NEW YORK
Niagara Falls
Buffalo
L. Erie
Erie
Pittsburg
PENNSYLVANIA
Trenton
Camden
Atlantic City
Sioux City
IOWA
Des Moines
Chicago
Ft. Wayne
Toledo
Cleveland
OHIO
Wheeling
Peoria
Springfield
INDIANA
Columbus
Indianapolis
Cincinnati
W. VIRGINIA
Chesapeake Bay
Norfolk
Kansas City
ILLINOIS
St. Louis
Topeka
Jefferson City
MISSOURI
Evansville
Ohio R.
Frankfort
Louisville
KENTUCKY
Richmond
Petersburg
Ozark Mts.
Cairo
Mammoth Cave
Mt. Mitchell
Raleigh
C. Hatteras
Nashville
Cumberland R.
TENNESSEE
Chattanooga
Memphis
Fort Smith
ARKANSAS
Little Rock
Tennessee R.
SOUTH CAROLINA
Columbia
Wilmington
Charleston
Atlanta
GEORGIA
Savannah
ATLANTIC OCEAN
MISSISSIPPI
Vicksburg
Jackson
ALABAMA
Montgomery
Dallas
Red R.
Sabine R.
LOUISIANA
Baton Rouge
Mobile
Pensacola
Tallahassee
Jacksonville
St. Augustine
New Orleans
Galveston
Tampa
FLORIDA
BAHAMA ISLANDS
GULF OF MEXICO
C. Sable
Key West
Havana
CUBA
UNITED STATES
Scale of Miles.
0 50 100 200 300
Capitals of Countries
Capitals of States
Other Cities
THE M.-N.CO.

74°
72° Longitude West 70° from Greenwich 68°
47°
45°
43°
41°
QUEBEC
Quebec
St. Lawrence R.
Lake St. Peter
Chaudière R.
Montreal
Richelieu R.
St. Albans
Burlington
Montpelier
Rutland
Green Mts.
Connecticut R.
NEW HAMPSHIRE
Androscoggin R.
Mt. Washington
White Mts.
Auburn
Lewiston
Bath
Portland
Biddeford
Rochester
Dover
Concord
Portsmouth
Manchester
Merrimac R.
Lawrence
Salem
C. Ann
Gloucester
Lowell
Nashua
Keene
Troy
Albany
Cambridge
Lynn
Massachusetts Bay
Boston
MASSACHUSETTS
Holyoke
Worcester
Springfield
Plymouth
Pawtucket
Providence
Fall River
Cape Cod Bay
C. Cod
Hartford
CONNECTICUT
Waterbury
New Haven
Bridgeport
RHODE ISLAND
Newport
New Bedford
NANTUCKET I.
MARTHAS VINEYARD I.
BLOCK I.
Long Island Sound
Montauk Pt.
LONG ISLAND
New York Bay
NEW YORK
Hudson R.
NEW BRUNSWICK
St. John R.
Houlton
Mt. Katahdin
Schoodic Lake
St. Croix R.
Calais
Eastport
MAINE
Kennebec R.
Bangor
Penobscot R.
Augusta
Rockland
Bar Harbor
MT. DESERT I.
ATLANTIC OCEAN
NEW ENGLAND STATES
Scale of Miles.
0 10 20 30 40 50 100
Capitals ◉ Other Cities •
THE M-N. CO.

FIG. 359.

Fig. 356.

Relief map of North America.

(Modelled by E. E. Howell.)

NORTH AMERICA
Scale of Miles.
0 500 1000
Capitals: ⊙ Other Cities: •
Comparative Area
PENN.
45,215 Square Miles.
100° Longitude West 90° from Greenwich 80°
THE M-N. CO.
ASIA
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
GREENLAND
(To Denmark)
ICELAND
Baffin Bay
Davis Strait
ALASKA
DOMINION OF CANADA
Hudson Bay
UNITED STATES
MEXICO
CENTRAL AMERICA
SOUTH AMERICA
WEST INDIES
Gulf of Mexico
Caribbean Sea
Chicago
St. Louis
Washington
New York
Philadelphia
Boston
Montreal
Ottawa
Quebec
Halifax
NOVA SCOTIA
NEWFOUNDLAND
St. Johns
San Francisco
New Orleans
Havana
Mexico
Vera Cruz
Acapulco
Colon
Panama
BERMUDA IS.
(Br.)
JAMAICA
(Br.)
BAHAMA (Br.) ISLANDS
PORTO RICO (To U.S.)
GREATER ANTILLES
LESSER ANTILLES
TROPIC OF CANCER
C. San Lucas
C. Hatteras
C. Sable
C. Race
Bering Sea
Bering Str.
WRANGEL I.
PRIBILOF IS.
KODIAK I.
QUEEN CHARLOTTE IS.
VANCOUVER I.
Sitka
Juneau
Dawson
Victoria
Vancouver
Winnipeg
Lake Winnipeg
L. Athabaska
Great Bear Lake
Great Slave Lake
ARCTIC ARCHIPELAGO
BAFFIN LAND
ARCTIC CIRCLE
LABRADOR
James B.
Nelson R.
Columbia R.
Great Salt Lake
Sierra Nevada
Coast Range
Cascade Range
Rocky Mountains
Appalachian Mts.
The Great Lakes
Mississippi R.
Missouri R.
Ohio R.
Arkansas R.
Red R.
Colorado R.
Rio Grande
Sierra Madre
Gulf of California
LOWER CALIFORNIA
FLORIDA
Florida St.
YUCATAN PENINSULA
C. Mendocino
Mt. McKinley
Mt. St. Elias
Mt. Logan
Yukon
Pt. Barrow

Fig. 857.

UNITED STATES
Scale of Miles.
0 50 100 200 300
Capitals of Countries
Capitals of States
Other Cities
CANADA
GULF OF MEXICO
ATLANTIC OCEAN
BAHAMA ISLANDS
Lake of the Woods
L. Superior
L. Michigan
L. Huron
L. Erie
L. Ontario
Quebec
Montreal
Ottawa
Toronto
Sault Ste. Marie
Duluth
St. Paul
WISCONSIN
Milwaukee
Madison
Chicago
Grand Rapids
Lansing
Detroit
Toledo
Cleveland
Erie
Buffalo
Rochester
Albany
NEW YORK
Boston
Portland
Augusta
Fredericton
Newport
New York
Trenton
Camden
Atlantic City
Philadelphia
Pittsburg
PENNSYLVANIA
Sioux City
IOWA
Des Moines
Peoria
Springfield
ILLINOIS
Kansas City
St. Louis
Jefferson City
MISSOURI
Topeka
Ozark Mts.
Ft. Wayne
INDIANA
Indianapolis
Evansville
OHIO
Wheeling
Columbus
Cincinnati
Frankfort
Louisville
KENTUCKY
Mammoth Cave
Cairo
Nashville
TENNESSEE
Chattanooga
Memphis
Fort Smith
ARKANSAS
Little Rock
MISSISSIPPI
Vicksburg
Jackson
ALABAMA
Montgomery
Mobile
Baton Rouge
New Orleans
Galveston
Dallas
Atlanta
GEORGIA
Savannah
Jacksonville
Tallahassee
St. Augustine
Tampa
Charleston
Columbia
SOUTH CAROLINA
Wilmington
Raleigh
NORTH CAROLINA
Mt. Mitchell
Richmond
Petersburg
Norfolk
Chesapeake
Charleston
Key West
C. Sable
Havana
CUBA
C. Hatteras
95° Greenwich
90°
85°
80°
75°
70°
65°
40°
35°
30°
25°
THE M.-N. CO.

NEW ENGLAND STATES
Scale of Miles.
0 10 20 30 40 50 100
Capitals ◉ Other Cities •
72° Longitude West 70° from Greenwich 68°
QUEBEC
NEW BRUNSWICK
MAINE
NEW HAMPSHIRE
VERMONT
NEW YORK
MASSACHUSETTS
CONNECTICUT
RHODE ISLAND
ATLANTIC OCEAN
Quebec
St. Lawrence R.
Lake St. Peter
Montreal
Richelieu R.
Chaudiere R.
St. John R.
Houlton
Mt. Katahdin
Schoodic Lake
St. Croix R.
Calais
Eastport
Bangor
Penobscot R.
Kennebec R.
Androscoggin R.
Augusta
Rockland
Bar Harbor
MT. DESERT I.
Lewiston
Bath
Portland
Biddeford
Auburn
Mt. Washington
White Mts.
Rochester
Dover
Concord
Portsmouth
Manchester
Merrimac R.
Lawrence
Salem
C. Ann
Gloucester
Lynn
Massachusetts Bay
Boston
Worcester
Cambridge
Lowell
Nashua
Keene
Troy
Albany
Holyoke
Springfield
Hartford
Providence
Pawtucket
Plymouth
Fall River
Cape Cod Bay
C. Cod
Waterbury
New Haven
Bridgeport
Newport
New Bedford
NANTUCKET I.
MARTHAS VINEYARD I.
BLOCK I.
Long Island Sound
Montauk Pt.
LONG ISLAND
New York Bay
Hudson R.
Connecticut R.
Burlington
Montpelier
Rutland
THE M-N. CO.

FIG. 359.

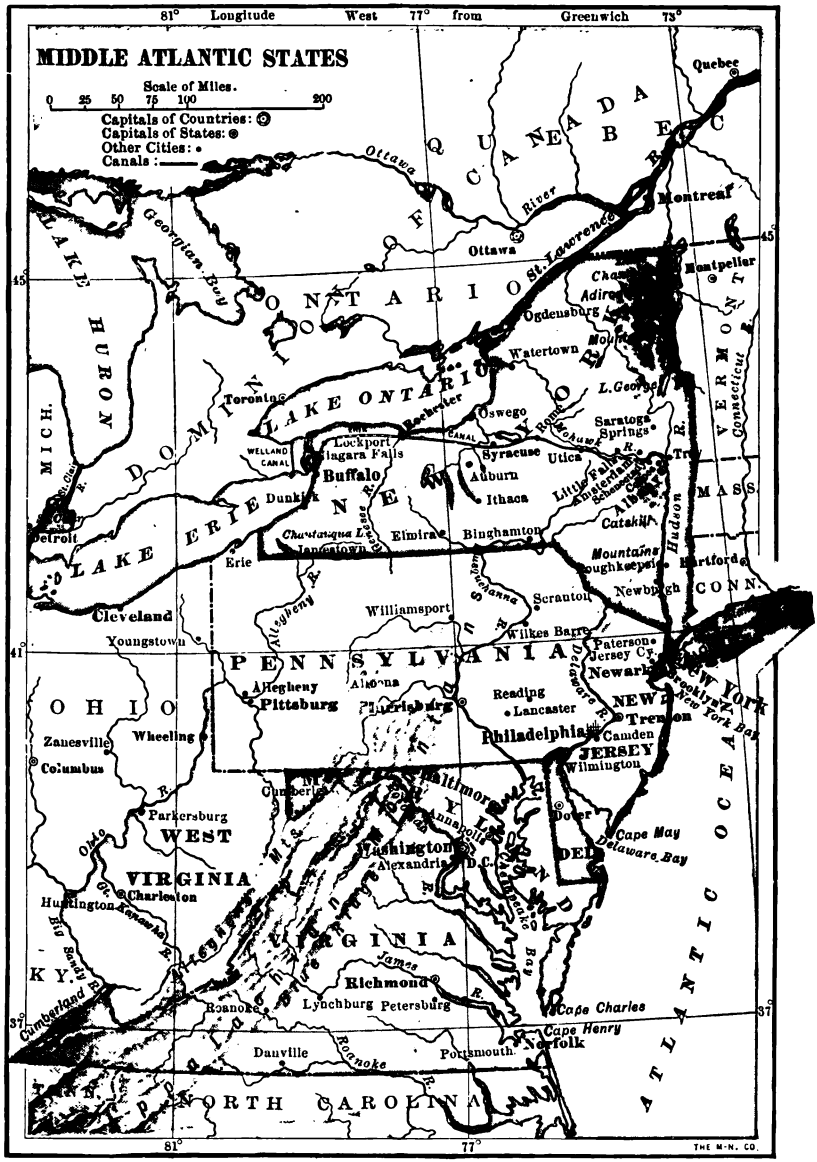

MIDDLE ATLANTIC STATES
Scale of Miles.
0 25 50 75 100 200
Capitals of Countries:
Capitals of States:
Other Cities:
Canals:
81° Longitude West 77° from Greenwich 73°
45°
41°
37°
QUEBEC
CANADA
ONTARIO
DOMINION OF CANADA
LAKE HURON
LAKE ERIE
LAKE ONTARIO
Ottawa River
Ottawa
Quebec
Montreal
St. Lawrence R.
Georgian Bay
Toronto
Lockport
Niagara Falls
WELLAND CANAL
Buffalo
Dunkirk
Erie
Cleveland
Youngstown
Detroit
MICH.
Ogdensburg
Watertown
Oswego
Rochester
Syracuse
Utica
Auburn
Ithaca
Elmira
Binghamton
Chautauqua L.
Jamestown
Montpelier
Saratoga Springs
L. George
Albany
Catskill
Mountains
Poughkeepsie
Newburgh
Hartford
Hudson R.
Mohawk R.
VERMONT
Connecticut R.
MASS.
CONN.
NEW YORK
Brooklyn
New York Bay
Scranton
Williamsport
Wilkes Barre
Susquehanna R.
Allegheny R.
PENNSYLVANIA
Pittsburg
Allegheny
Altoona
Harrisburg
Reading
Lancaster
Philadelphia
Paterson
Jersey Cy.
Newark
Delaware R.
NEW JERSEY
Trenton
Camden
Wilmington
OHIO
Zanesville
Wheeling
Columbus
Parkersburg
WEST VIRGINIA
Ohio R.
Cumberland
Baltimore
Annapolis
Washington
Alexandria
D.C.
Dover
DEL.
Cape May
Delaware Bay
Chesapeake Bay
Huntington
Charleston
Big Sandy R.
Gt. Kanawha R.
KY.
Cumberland R.
Appalachian Mts.
Blue Ridge Mts.
VIRGINIA
James R.
Richmond
Roanoke
Lynchburg
Petersburg
Danville
Roanoke R.
Portsmouth
Norfolk
Cape Charles
Cape Henry
TENN.
NORTH CAROLINA
ATLANTIC OCEAN
THE M-N. CO.

FIG. 360.

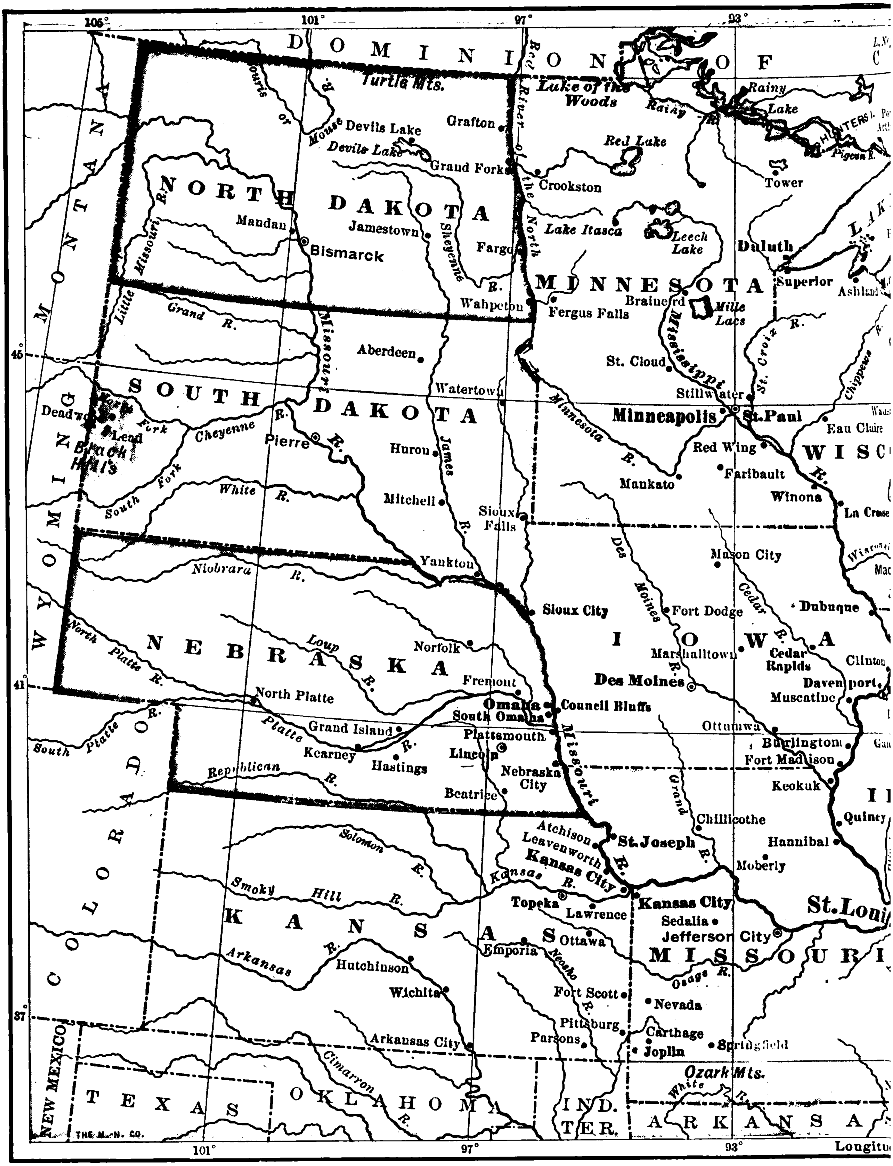

DOMINION OF
Turtle Mts.
Lake of the Woods
Rainy Lake
Red Lake
Tower
NORTH DAKOTA
Devils Lake
Grafton
Grand Forks
Mandan
Bismarck
Jamestown
Fargo
Wahpeton
Crookston
Lake Itasca
Leech Lake
Duluth
Superior
Ashland
MINNESOTA
Fergus Falls
Brainerd
Mille Lacs
St. Cloud
Stillwater
Minneapolis
St. Paul
Eau Claire
Red Wing
Faribault
Mankato
Winona
La Crosse
MONTANA
WYOMING
SOUTH DAKOTA
Deadwood
Lead
Black Hills
Pierre
Aberdeen
Watertown
Huron
Mitchell
Sioux Falls
Yankton
NEBRASKA
Sioux City
Norfolk
Fremont
North Platte
Omaha
Council Bluffs
South Omaha
Grand Island
Kearney
Hastings
Plattsmouth
Lincoln
Nebraska City
Beatrice
IOWA
Mason City
Fort Dodge
Dubuque
Marshalltown
Cedar Rapids
Clinton
Des Moines
Davenport
Muscatine
Ottumwa
Burlington
Fort Madison
Keokuk
Quincy
Hannibal
Moberly
Chillicothe
St. Joseph
Atchison
Leavenworth
Kansas City
Topeka
Lawrence
Sedalia
Jefferson City
St. Louis
COLORADO
KANSAS
Ottawa
Emporia
Hutchinson
Wichita
Fort Scott
Nevada
Pittsburg
Parsons
Carthage
Joplin
Springfield
Arkansas City
MISSOURI
Ozark Mts.
NEW MEXICO
TEXAS
OKLAHOMA
IND. TER.
ARKANSAS
105°
101°
97°
93°
46°
41°
37°
Longitu

FIG. 3

CENTRAL STATES
Scale of Miles.
0 25 50 75 100 200 300
Cities with over 1,000,000: .... Chicago
Cities with 500,000 to 1,000,000: .. St. Louis
Cities with 200,000 to 500,000: ..... Buffalo
Cities with 50,000 to 200,000: ..... Toledo
Cities with 25,000 to 50,000: ..... Lexington
Smaller Places: ..... Alpena
Capitals with less than 25,000: .. Charleston
Capitals of States: ◉ Other Cities: •
89°
85°
81°
77°
45
37
CANADA
L. Nepigon
Port Arthur
ISLE ROYAL
SUPERIOR
Calumet
Houghton
Mineral Range
Marquette
Ishpeming
Sault Ste. Marie
St. Marys R.
MACKINAC I.
Str. of Mackinac
Cheboygan
Georgian Bay
LAKE HURON
Alpena
Menominee R.
Menominee
Marinette
Green Bay
Appleton
Oshkosh
Lake Winnebago
Fond du Lac
Manitowoc
Sheboygan
Milwaukee
Watertown
Madison
Janesville
Racine
Manistee
Muskegon R.
Muskegon
West Bay City
Saginaw Bay
Bay City
Saginaw
Port Huron
Flint
Lansing
Lake St. Clair
Detroit
Grand Rapids
Battle Creek
Kalamazoo
Jackson
Ann Arbor
Adrian
Toledo
Toronto
LAKE ONTARIO
Niagara Falls
ERIE CANAL
Buffalo
NEW YORK
LAKE ERIE
Erie
Cleveland
Youngstown
Akron
Sandusky
Findlay
Alliance
Massillon
Canton
East Liverpool
Steubenville
Allegheny R.
Allegheny
Pittsburg
PENNSYLVANIA
Chicago
Elkhart
Goshen
South Bend
Michigan City
Hammond
Fort Wayne
Maumee R.
Lima
Mansfield
OHIO
Newark
Wheeling
Zanesville
Columbus
Piqua
Springfield
Dayton
Marietta
Chillicothe
Parkersburg
Hamilton
Cincinnati
Portsmouth
Ironton
Charleston
WEST VIRGINIA
Huntington
Ohio R.
Kentucky R.
Kanawha R.
Rockford
Evanston
Elgin
Oakpark
Aurora
Joliet
Freeport
Rock R.
Moline
Rock Island
La Salle
Streator
Ottawa
Kankakee
Peoria
Bloomington
ILLINOIS
Danville
Springfield
Decatur
Jacksonville
Illinois R.
Alton
East St. Louis
Belleville
Mississippi R.
Cairo
Paducah
New Madrid
Logansport
Marion
Lafayette
Muncie
Anderson
INDIANA
Richmond
Indianapolis
Terre Haute
Madison
Covington
Jeffersonville
New Albany
Evansville
Louisville
Frankfort
Lexington
Owensboro
Hendersonville
KENTUCKY
Green R.
Mammoth Cave
Bowling Green
Middlesboro
Cumberland Mts.
Nashville
Knoxville
TENNESSEE
NORTH CAROLINA
Wabash R.
Ohio R.
Cumberland R.
Tennessee R.
Kaskaskia R.
Illinois R.
Rock R.
Allegheny R.
Mississippi R.
West 89° from Greenwich
85°
81°

WESTERN STATES
Scale of Miles.
0 50 100 200 300 400
State Capitals: ◉
Other Cities: •
DOMINION OF CANADA
PACIFIC OCEAN
WASHINGTON
OREGON
IDAHO
MONTANA
WYOMING
UTAH
COLORADO
NEVADA
CALIFORNIA
ARIZONA
NEW MEXICO
TEXAS
MEXICO
Vancouver
Victoria
Bellingham
Everett
Seattle
Tacoma
Olympia
Spokane
Wallace
Kalispell
Great Falls
Helena
Anaconda
Butte
Billings
Bozeman
Miles City
Buffalo
Fremont Pk.
Rawlins
Laramie
Cheyenne
Evanston
Salt Lake City
Provo City
Ogden
Logan
Boise
Pocatello
Lewiston
Baker City
Lagrande
The Dalles
Mt. Hood
Portland
Astoria
Salem
Albany
Ashland
Eureka
Reno
Virginia City
Carson City
Austin
Eureka
Sacramento
San Francisco
Oakland
San Jose
Stockton
Fresno
Mt. Whitney
Santa Barbara
Los Angeles
San Bernardino
San Diego
Pt. Conception
SANTA BARBARA ISLANDS
Cape Mendocino
Mt. Shasta
Great Salt Lake
Great Basin
Sierra Nevada
Coast Range
Mohave Desert
Colorado Range
Wasatch Mts.
Sevier Lake
Denver
Colorado Springs
Leadville
Cripple Creek
Pikes Peak
Pueblo
Blanca Peak
Durango
Trinidad
Santa Fe
Las Vegas
Albuquerque
Roswell
Silver City
Las Cruces
El Paso
Phoenix
Yuma
Tucson
Tombstone
Flagstaff
Grand Canyon
Little Colorado R.
Colorado
Gila R.
Salt R.
Rio Grande
Gulf of California
LOWER CALIFORNIA
Missouri
Yellowstone
Milk R.
Snake R.
Columbia R.
Owyhee
Humboldt R.
Green R.
Grand R.
Arkansas R.
Platte R.
Cheyenne R.
Black Hills
Little Missouri R.
Bitter Root Mts.
Rocky Mountains
Sierra Nevada
Coast Range
Mt. Rainier
Puget Sound
Str. of Juan de Fuca
C. Flattery
Port Townsend
Vancouver Isl.
Longitude West from Greenwich
M.N. CO

FIG. 363.

ery of the Far West, including the hot springs and geysers of the *Yellowstone National Park*, bears evidence to the former existence of volcanoes. What can you tell about *geysers*?

Climate. — The factors determining the *temperature* of any country were enumerated on page 41. What are they? How must the temperature of the Central Plains differ from

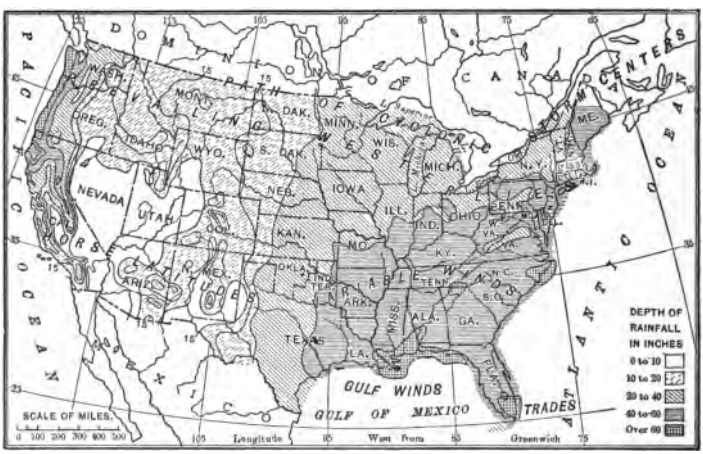


FIG. 367.

A map to show the rainfall of the United States in inches.

that of the Rocky Mountains, as a result of the influence of altitude? How must the temperature of the coast differ from that of the interior? Why?

A general statement of the great *wind belts* which influence North America is given on pages 26–28, and they are shown graphically in Figure 25. Name these belts. Figures 38 and 39, together with the accompanying text, explain the *ocean currents* that approach our shores. Describe them. The effects of these winds and ocean

currents upon our western coast and interior are stated on pages 160 and 161 (see also Fig. 29). The nature and influence of *cyclonic storms* are discussed on pages 38 and 39. Recalling these various facts, explain the isotherms for North America in Figures 36 and 37. Figure 367 shows

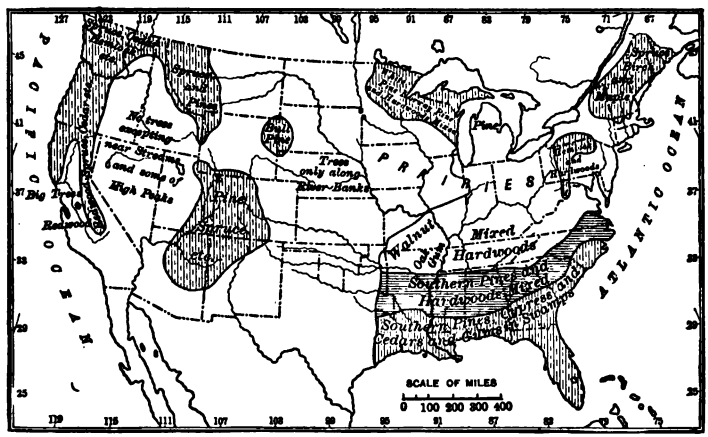


FIG. 368.

Map showing the regions from which much timber is now being obtained.

the *rainfall* for the United States. Give the reasons for the differences in rainfall.

INDUSTRIES

Lumbering. — Figure 368 shows the main parts of the United States in which lumbering is now carried on. Name the sections; also the kinds of trees and some of the principal animals (see also p. 68). Why do the largest trees grow on the western coast? (p. 468). Besides lumber, *tannic acid* for tanning leather is obtained from these forests; also *turpentine;* and *wood pulp* for the manu·

facture of paper. How is *maple sugar* obtained? Recall some of the facts about lumbering in different sections.

Most of the cities of Maine are engaged in handling lumber. BANGOR is the most important port for its shipment; PORTLAND has lumber mills, etc.; and BATH is noted for its shipbuilding. There is also manufacturing of doors, blinds, and other articles of wood in many New England cities, as BURLINGTON, Vt. Paper mills are found along the rivers of Maine, New York, Pennsylvania, Wisconsin, Minnesota, and other states. HOLYOKE, Mass., is a centre for making paper from rags.

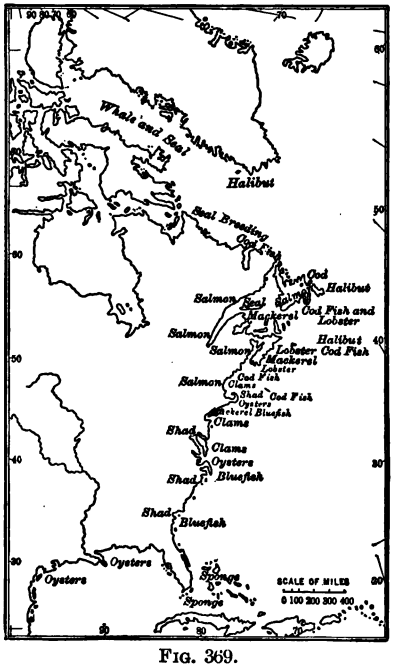


FIG. 369.
Sections where ocean fish are found.

In the South, Georgia pine is shipped from CHARLESTON, SAVANNAH, JACKSONVILLE, MOBILE, and smaller ports. MEMPHIS is a centre for hard wood; and the manufacture of doors, blinds, furniture, etc., is extensively carried on in ATLANTA, MONTGOMERY, MOBILE, CHATTANOOGA, NASHVILLE, LITTLE ROCK, and many smaller places.

The lumber business is also important in many of the

Central States. The water power at MINNEAPOLIS has long been used for sawmills; and the excellent position of DULUTH and SUPERIOR for shipping lumber by lake, has given rise to an important lumber industry at these points also. Many cities within easy reach of the northern forests are engaged in the manufacture of furniture and other articles of wood. This is true, for example, of CHICAGO, of LA CROSSE and OSHKOSH, WIS., and of SAGINAW, BAY CITY, and GRAND RAPIDS, Mich.

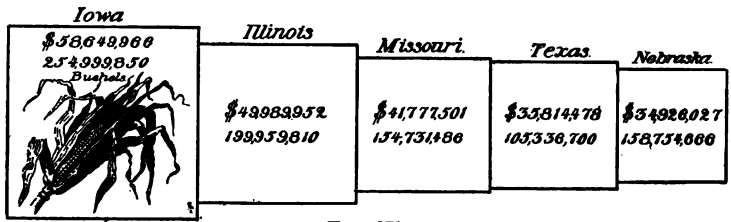


FIG. 370.

Corn production, in dollars and in bushels, in the five leading corn-producing states.

TACOMA and SEATTLE owe much of their importance to their great sawmills and planing mills; and PORTLAND, Oregon, also has extensive lumber industries. Locate these various places on the maps (Figs. 359–363).

Fishing. — Figure 369 represents the products obtained by fishing on our eastern coast. Make a list of the different kinds and state the general distribution of each. GLOUCESTER, BOSTON, and PORTLAND are important in this industry, and BALTIMORE and NORFOLK are centres for the oyster trade. Immense numbers of salmon are canned along the Columbia River near PORTLAND, Oregon, and in western Canada and Alaska.

Agriculture and Related Manufacturing. — Among agricultural products by far the most valuable is *corn*. Figure

FIG. 371.

On these maps the spaces left blank indicate either little or no production.

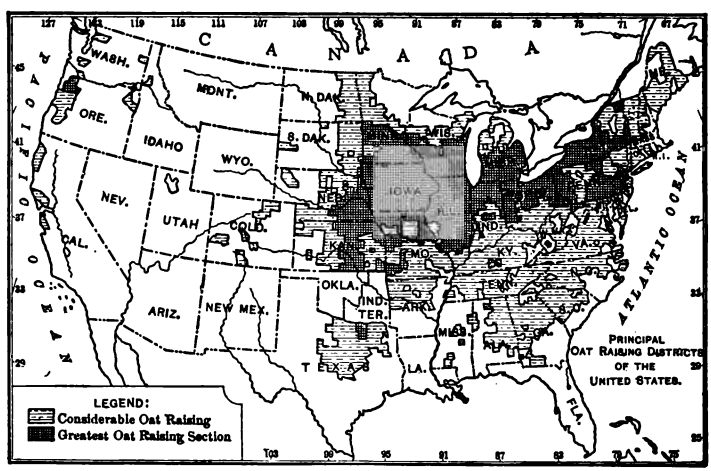


FIG. 372.

371 represents the corn districts. Note that the Southern States produce a large amount. Why is there so little in

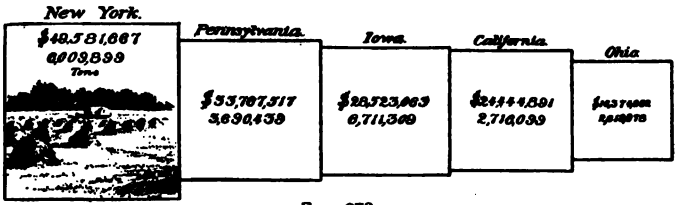


FIG. 373.

Hay production, in dollars and tons, in the five principal hay-producing states.

the Far West? What is the rank of the five leading states in this cereal? (Fig. 370). Enumerate the uses to which

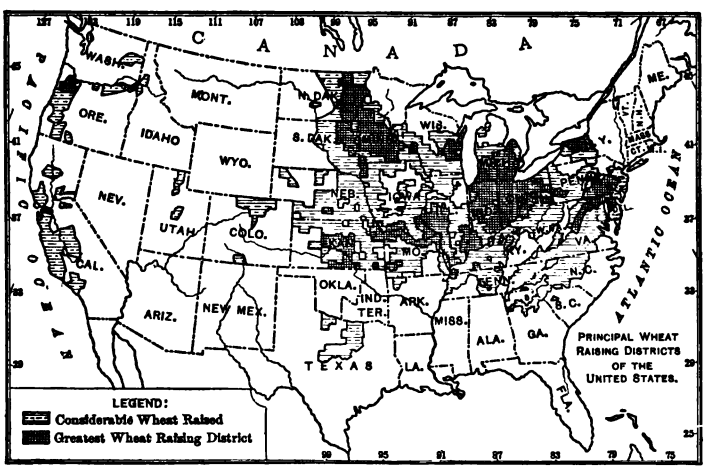


FIG. 374.

corn is put. How does the area for *oats* (Fig. 372) compare with that for corn? Note the leading states for *hay* (Fig. 373). Does Figure 374 show *wheat* to be more, or

less widely distributed than corn? Why should it be? Which of the Western States must rely upon irrigation

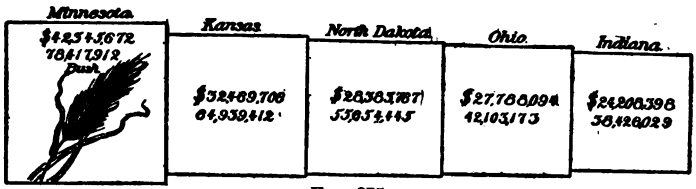


FIG. 375.

Wheat production, in dollars and bushels, in the five leading wheat-producing states.

for raising wheat? Name the five leading wheat states in the order of their rank (Fig. 375). How does the value

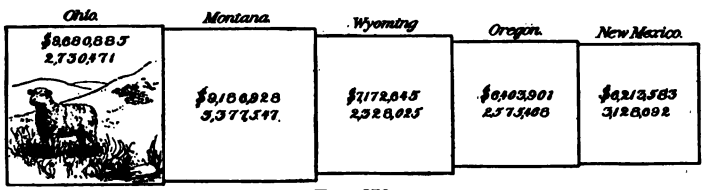


FIG. 376.

Number of sheep and their value in the five leading sheep-producing states.

of hay in the five states that lead in its production compare with that of wheat in the five principal wheat states?

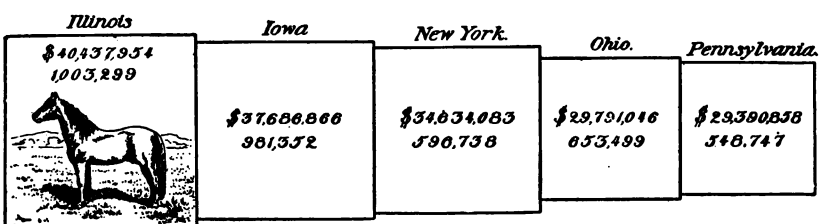


FIG. 377.

Number of horses and their value in the five principal horse-producing states.

Excepting in the northwest, — that is, north of central California near the Pacific coast, — most of the country west of the 100th meridian is too arid for agriculture without irrigation. This, therefore, is our great *grazing* region.

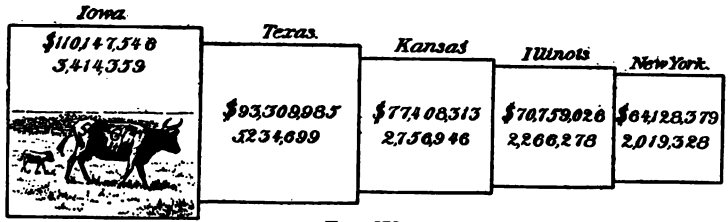


FIG. 378.
Number of cattle and their value in the five principal cattle-producing states.

Which of our states produce most *sheep?* (Fig. 376). Which eastern state surpasses all others in number of sheep? Large numbers of *horses* are raised in the ranch country; but Figure 377 shows that the five leading

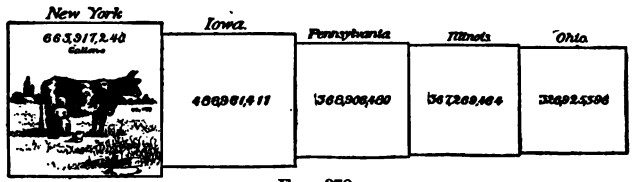


FIG. 379.
Five principal milk-producing states.

states in the production of horses are farther east. Do Figures 372 and 373 suggest a reason for this? Name the five leading states for *cattle* (Fig. 378). No one of these states is altogether in the ranch country, although the second and third are semi-arid in their western part. Note the principal *milk*-producing states (Fig. 379). To what extent are these states the same as those in Figure 373? What resemblance do you find between the five

states producing most corn (Fig. 370) and the five producing the largest number of *hogs?* (Fig. 380). Why?

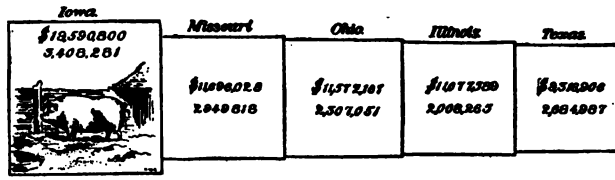


FIG. 380.

Number of hogs and their value in the five principal hog-producing states.

These various agricultural products are of immense importance in the great shipping and manufacturing centres. Name the five chief *shipping points* along the Great Lakes (Fig. 358). Make a list of the five largest cities on the Mississippi River and its tributaries; the five largest on the eastern coast; the three largest on the western coast. Arrange these in the order of their population (see table, p. 552). Which are included among the twelve largest cities in the country? (see table, p. 551).

OMAHA, KANSAS CITY, ST. LOUIS, and CHICAGO are noted markets for *live stock* and *grain.* Why these in particular? Besides sending these products eastward, they pack a great amount of *meat* and mill much *flour.* In the southwest the shipping points for western cattle are DALLAS and FORT WORTH in Texas.

MINNEAPOLIS, MILWAUKEE, TOLEDO, EVANSVILLE, and NASHVILLE are noted for *flour.* Both *brewing* and *distilling*, which require grain, are important industries in a number of the cities of the Central States, the former especially at MILWAUKEE, ST. LOUIS, and CINCINNATI, the latter at LOUISVILLE and PEORIA.

Nearly all the cities in the fertile Central States are

engaged in industries connected with the products of the region. For example, COLUMBUS and INDIANAPOLIS handle grain and manufacture *farming implements;* and DAYTON is noted for its manufacture of farm machinery. These and other cities of this section are *trade centres*, supplying the towns, villages, and farms with needed implements and other articles. Notice, for example, the number of large towns along the Mississippi and Missouri rivers and their larger tributaries. Besides those already mentioned some of the largest are ST. PAUL, ST. JOSEPH, and DES MOINES. Find others.

Many of the products of the Central States are sent east for consumption or for manufacture. For example, hides are shipped to tanneries in the central and eastern states; and the leather then goes to the factories at LYNN and BROCKTON, Mass., ROCHESTER, N.Y., and elsewhere, to be made into *boots* and *shoes*. Leather goods are also made in the cities of the middle west, as, for example, in ST. LOUIS.

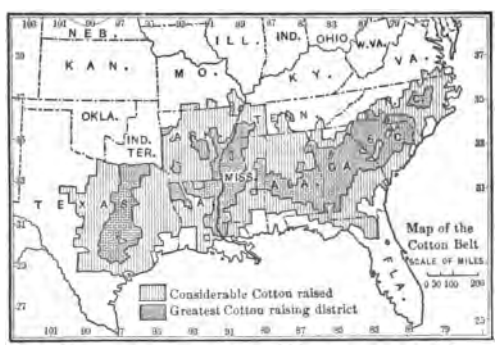


FIG. 381.

Observe the extent of the *cotton* belt (Fig. 381) and the rank of the principal cotton-producing states (Fig. 382). NEW ORLEANS, MEMPHIS, ATLANTA, and numerous other southern cities are important cotton markets. What seaports must ship a large amount of cotton? Of late *cotton*

manufacturing has been rapidly increasing in the South; and among the cities which are extensively engaged in manufacturing cotton goods and cotton-seed oil are

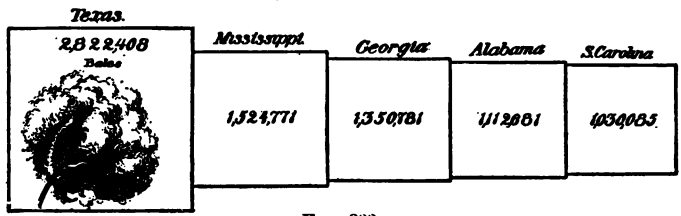


FIG. 382.
Five principal cotton-producing states.

COLUMBIA and GREENVILLE, S.C., CHARLOTTE, N.C., and AUGUSTA, COLUMBUS, and ATLANTA, Ga. Texas manufactures little, although nearly every Texan city is important for cotton. Name and locate several of the largest.

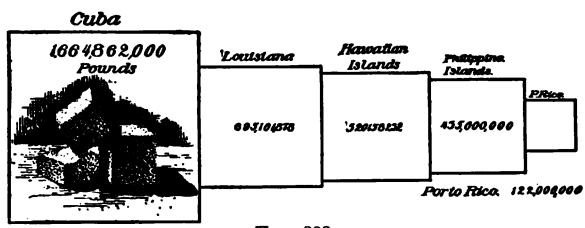


FIG. 383.
Principal sugar-producing districts in the United States and its dependencies; also including Cuba.

Of the southern cotton much is sent to New England, which is even more busily engaged in *cotton manufacturing* than the South. Many of the cities of southern Maine and New Hampshire, as well as many in Massachusetts, Rhode Island, New York, and other states, are engaged in the manufacture of cotton or woollen goods or both.

Among these are PHILADELPHIA Pa., FALL RIVER, LOWELL, LAWRENCE, NEW BEDFORD, and TAUNTON, Mass.; PROVIDENCE and PAWTUCKET, R. I.; MANCHESTER, N.H.; LEWISTON, Me.; and UTICA, N.Y.

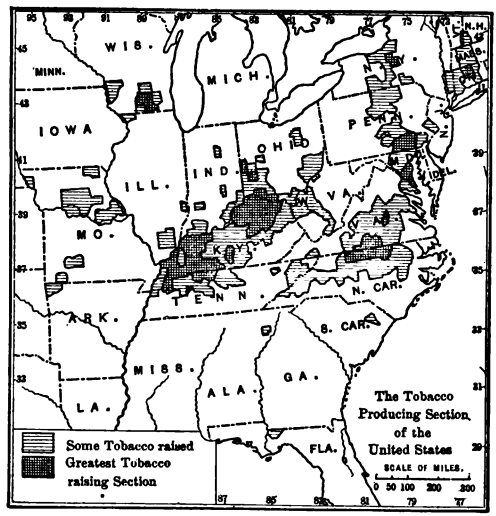


FIG. 384.

Note the rank of Louisiana in the production of *sugar* and sugar cane (Fig. 383). Naturally there are many sugar refineries in NEW ORLEANS. In what section is *rice* cultivated? (Fig. 432). Name the chief *tobacco* states (Fig. 384). RICHMOND, LOUISVILLE, and ST. LOUIS are our principal tobacco markets, while Lynchburg and Danville, Va., and Raleigh and Durham, N.C., are extensively engaged in tobacco manufacture.

FIG. 385.

What are our chief kinds of *fruits*, and in what sections are they raised? (Fig. 385). Much of the prosperity of Los Angeles, Cal., is dependent upon the fruit raised in its vicinity by the aid of irrigation. To the use of irrigation is also due the fruit and other agricultural industries near Salt Lake City, Utah. Near the shores of the Great Lakes immense quantities of grapes, apples, pears, and other fruits are raised. Why near the Great Lakes? Rochester, N.Y., is a noted

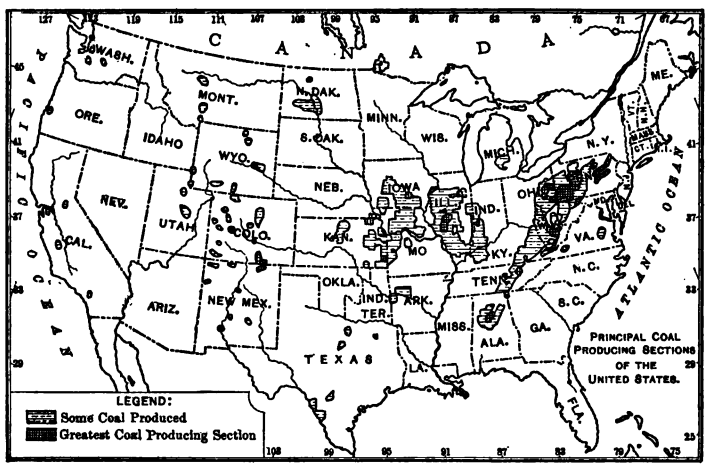


Fig. 386.

centre for the *nursery business*, which is important in the fruit country. *Canning* is another great industry connected with fruit, as, for example, at Baltimore and Wilmington. Why there?

Mining and Manufacturing Dependent upon Mining. — *Coal* and *iron* are the most important minerals for manufacturing. Tell about their distribution (Figs. 386 and 389). What is the rank of the leading states in each product? (Figs. 387 and 388). In regard to coal in Penn-

sylvania, see page 183. The neighboring states of Maryland, West Virginia, and Ohio have extensive deposits of bituminous coal. What about the coal in the states farther west? (Fig. 386).

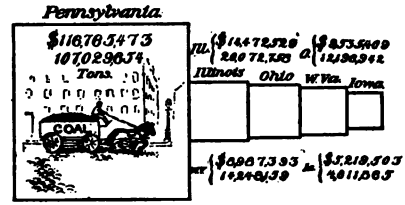


FIG. 387.
Coal production, in dollars and tons, in the five leading coal-producing states.

Owing to special advantages mentioned on pages 183–184, Pennsylvania is distinguished for the manufacture of *iron and steel goods*. PHILADELPHIA manufactures cars, steel ships, and many other articles of iron. PITTSBURG and ALLEGHENY make iron and steel goods of nearly every description; and in SCRANTON, READING, HARRISBURG, ERIE, and a score of other cities there are furnaces, foundries, and machine shops for iron manufacturing.

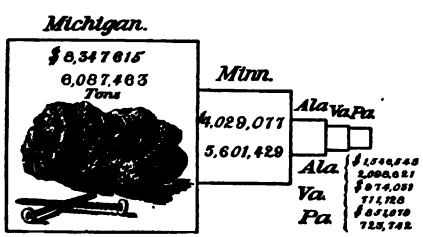


FIG. 388.
Iron ore production, in dollars and tons, in the five leading iron ore-producing states.

Neighboring states also enjoy the benefit of the abundant coal of this region. In New Jersey, NEWARK, JERSEY CITY, CAMDEN, and HOBOKEN manufacture iron goods. NEW YORK CITY does the same, and there is iron manufacturing at BUFFALO, ROCHESTER, SYRACUSE, ALBANY, TROY, and many other New York cities. WILMINGTON, Del., like Philadelphia, is noted for its cars and steel ships; and BALTIMORE, WHEELING, W.Va., and ROANOKE, Va., carry on iron and

steel manufacturing. What is the rank of Virginia among iron-producing states? (Fig. 388).

For reasons stated on page 184, the iron ore of the Lake Superior region is transported to distant cities, even as far as the cities of Pennsylvania, for manufacture. Boats with ore leave the lake ports of DULUTH, SUPERIOR, ASHLAND, and MARQUETTE for cities all along the Great Lakes,

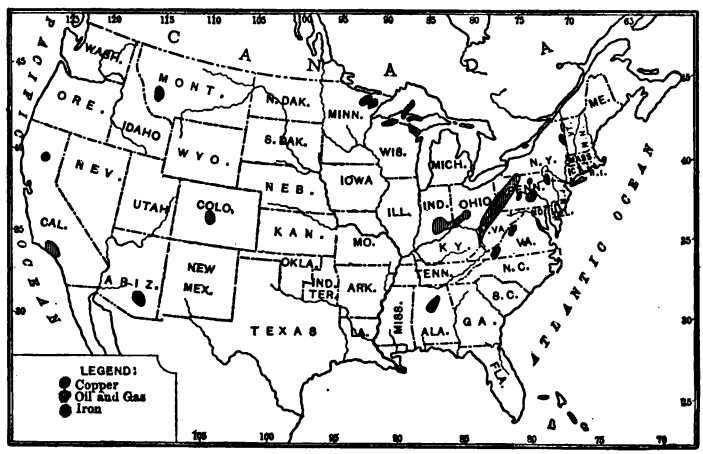


FIG. 389.

Leading iron, copper, oil, and gas producing regions.

especially those which can easily secure coal. Some of these cities draw upon the Pennsylvania coal fields; others obtain coal from Ohio, Indiana, and Illinois. Among the lake cities which receive Lake Superior iron are CHICAGO, CLEVELAND, BUFFALO, DETROIT, MILWAUKEE, and TOLEDO. But many others, both on the lakes and at a distance from them, are partly or wholly supplied with iron for manufacture from the Lake Superior region, the most productive iron field in the world.

New England also consumes much iron, manufacturing especially such articles as are light and require much skill. Why? Many of the smaller places are engaged in such work, and among the larger cities BOSTON, WORCESTER, SPRINGFIELD, HARTFORD, NEW HAVEN, and BRIDGEPORT make many kinds of articles of metal, including wire, machinery, hardware, firearms, cartridges, bicycles, sewing machines, etc.

In Alabama, as in Pennsylvania, both coal and iron are found; and at BIRMINGHAM, which has both minerals near at hand, the iron and steel industry is extensive (p. 184). ATLANTA, KNOXVILLE, and CHATTANOOGA also have iron industries. We have already seen that many cities in the Central States are engaged in iron manufacturing, since they make farming implements; and many other forms of iron goods receive their attention. In the Far West there is less manufacturing; but PUEBLO, Colo., has large iron works.

In some sections *natural gas* is used as a fuel in place of coal; for example, in the neighborhood of PITTSBURG in the manufacture of glass. On Figure 389, point out the leading oil and gas districts. Name other products than kerosene that are obtained from petroleum.

What states produce *copper?* (Fig. 389). Michigan, in the neighborhood of Calumet, has very large copper mines; and at BUTTE, Mont., more copper is mined than in any other district in the world. Name the cities in southern Arizona (Fig. 362) near the copper-producing region (Fig. 389).

Lead and *zinc* are other important metals. Many of the silver ores of the Far West yield lead, as, for example, at LEADVILLE, Colo. Both lead and zinc are found in several of

the Central States, one of the leading districts being at JOPLIN, Mo. Much zinc is used for mixing with copper to form the alloy *brass*. WATERBURY, Conn., is an important centre for the manufacture of brass goods.

How widely distributed are the *gold* and *silver* mines? (Fig. 390). Name the principal states for each metal in the order of their rank (Figs. 391 and 392). DENVER

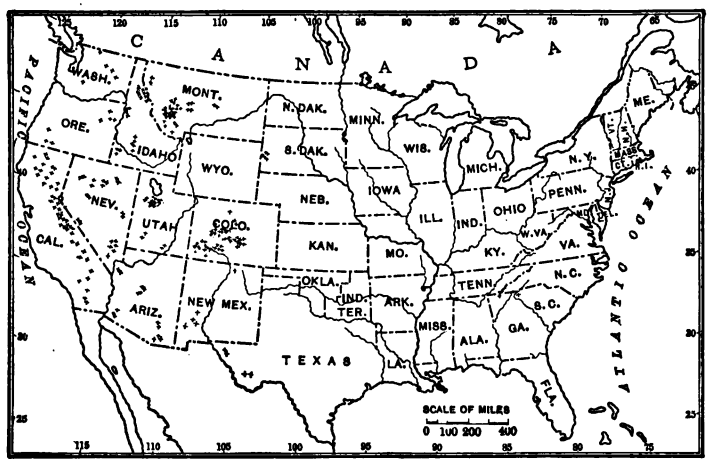


FIG. 390.
Gold and silver producing regions indicated by crosses.

owes much of its importance to the numerous mining towns in its vicinity. Why? One of the best known is CRIPPLE CREEK; LEADVILLE is another. Some of this metal is sent to eastern cities, such as PROVIDENCE, to be used in the manufacture of jewellery, etc.; but large quantities go to the government mints to be coined for use as money.

Compare the value of the precious metals (Figs. 391 and 392) with that of hay (Fig. 373). With that of cattle

(Fig. 378). Which of the products shown in these various diagrams has the greatest total value?

Besides the mineral products mentioned, there are others of great importance. For example, *salt* is found in New York, Michi-

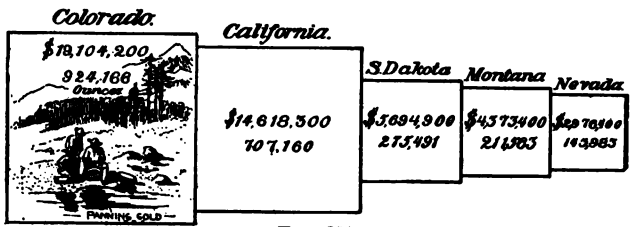


FIG. 391.

Gold production, in dollars and ounces, in the five leading gold-producing states.

gan, Kansas, and other states. *Phosphates* are obtained at CHARLESTON, S.C., and in Florida. *Clays* for bricks and tiles occur in many sections, one of the most noted being the Hudson Valley above New York; but the finer pottery clays are

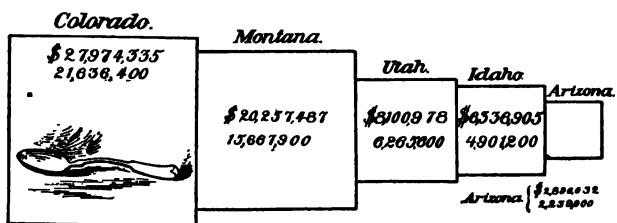


FIG. 392.

Silver production, in dollars and ounces, in the five leading silver-producing states.

less common, one of the most important centres being TRENTON, N.J. Building stones of one kind or another are quarried in every state; but Ohio, Indiana, and other Central States produce *sandstone* and *limestone* especially; the New England States *granite;* the neighborhood of RUTLAND, Vt., *marble;* and Vermont, New York, Pennsylvania, and Maine *slate.*

Manufacturing. — The great industries supplying raw products are seen to be *lumbering*, *fishing*, *agriculture*, *grazing*, and *mining*, of which agriculture is the most important. *Manufacturing*, a sixth great industry, is seen to be directly related to these products. Our cities are largely engaged in manufacturing, and have so many

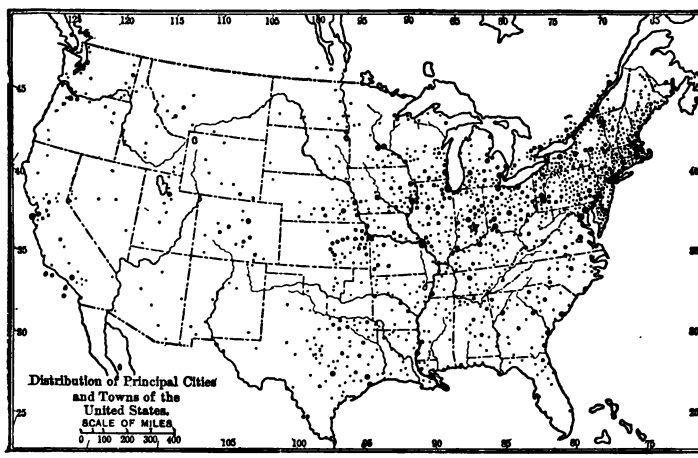
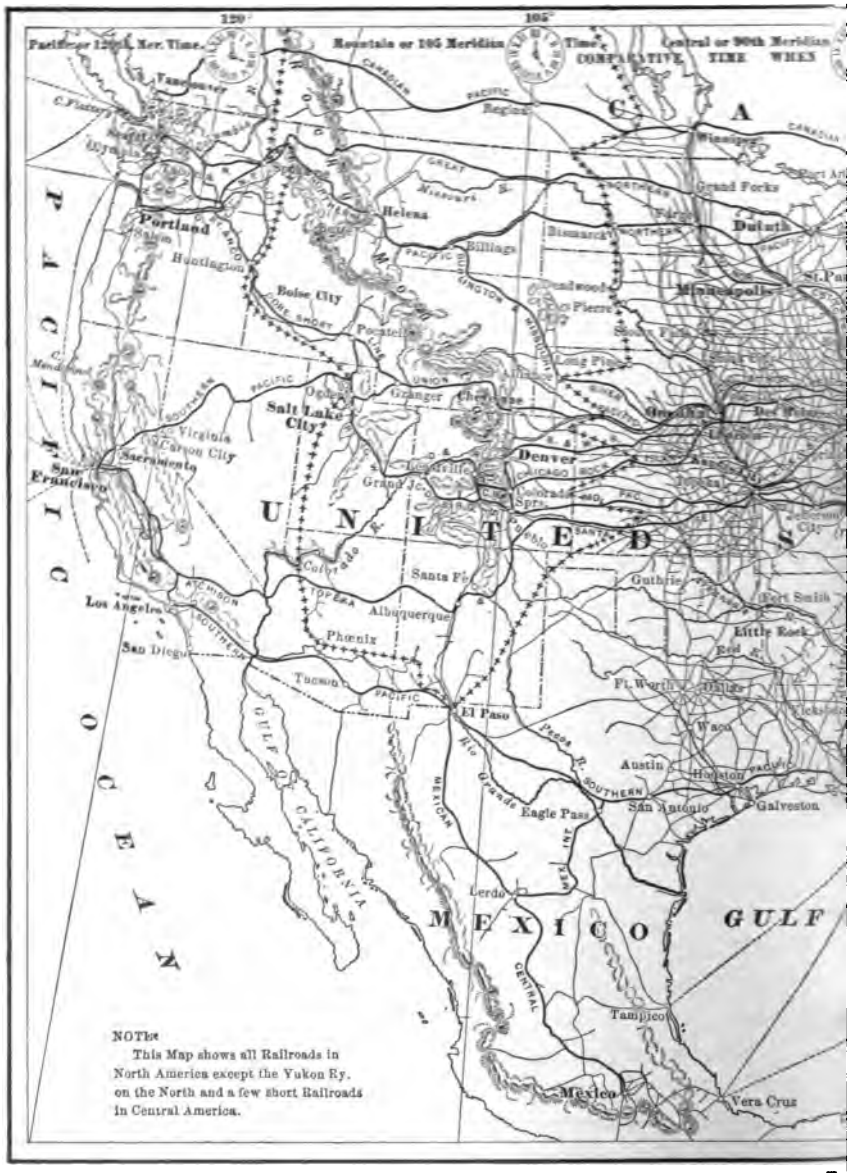


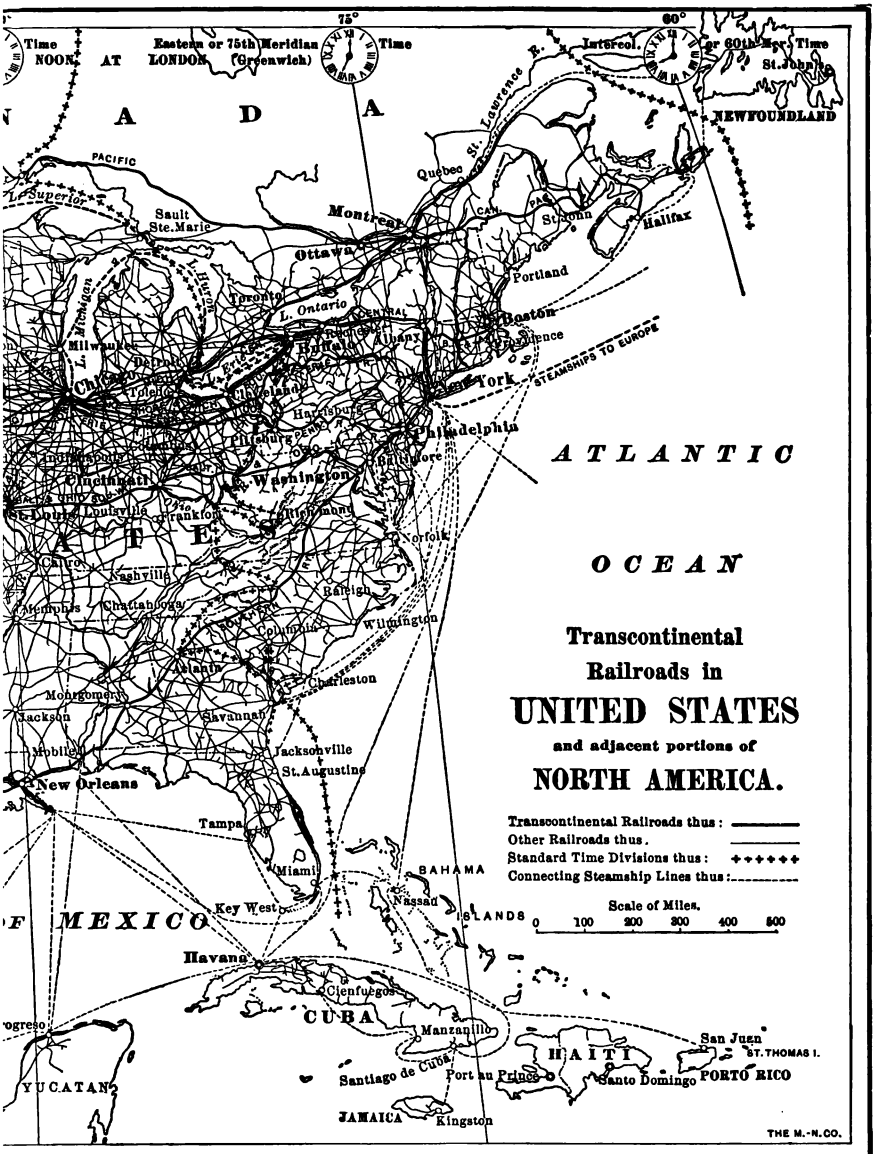
FIG. 393.

The star shows the centre of population of the United States.

kinds that a mere list of them would occupy many pages. A number of the cities are noted especially for one kind of manufacture, as PATERSON, N.J., for silk; TROY, N.Y., for shirts, collars, and cuffs; SYRACUSE, N.Y., for the works in which soda is made from salt; BROCKTON, Mass., for shoes; FALL RIVER, Mass., for cotton goods, etc. But some of these cities have other important manufactures; and the larger commercial cities make scores of very different classes of articles. For example, BOSTON


120°
105°
Pacific or 120th Mer. Time.
Rocky Mountain or 105 Meridian Time.
Central or 90th Meridian Time
COMPARATIVE TIME WHEN
Vancouver
Portland
Huntington
Boise City
Helena
Billings
Bismarck
Grand Forks
Duluth
Minneapolis
Winnipeg
Salt Lake City
Ogden
Granger
Cheyenne
Denver
Pueblo
Virginia City
Carson City
Sacramento
San Francisco
Los Angeles
San Diego
Colton
Santa Fé
Albuquerque
Phœnix
Tucson
El Paso
Guthrie
Fort Smith
Little Rock
Ft. Worth
Dallas
Waco
Austin
Houston
Galveston
San Antonio
Eagle Pass
Rio Grande
Lerdo
Tampico
Mexico
Vera Cruz
PACIFIC OCEAN
GULF OF CALIFORNIA
MEXICO
GULF
UNITED STATES
CANADA
NOTE
This Map shows all Railroads in North America except the Yukon Ry. on the North and a few short Railroads in Central America.

Fig



Transcontinental Railroads in UNITED STATES and adjacent portions of NORTH AMERICA.

and its suburbs, which include the large cities of CAMBRIDGE and SOMERVILLE, manufacture almost every kind of article that can be named.

Commerce. — In connection with the production of raw materials and with manufacturing there must be much trade and transportation of goods, or *commerce*. More than half of our people are occupied in providing raw products and hence live in country districts, while the cities are mainly concerned with manufacturing and commerce. Give several examples showing the interdependence of country and city districts. According to Figure 393, in what quarter of the United States are most of our cities found? Our railways? (Fig. 394).

In the table (p. 551) you will find a list of the twenty-five largest cities. Locate each and tell what you know about it. Which of these cities is nearest your home? In what section of the country is the greatest number? Why? Which are on the sea-shore? Which are on the Great Lakes? Which are on navigable rivers? (Fig. 396). Which are not on navigable waters?

Name and locate our great cities along the Atlantic seaboard. They are not only manufacturing centres, but also eastern gateways to and from the interior, as SEATTLE, TACOMA, PORTLAND, and SAN FRANCISCO are gateways on the western side.

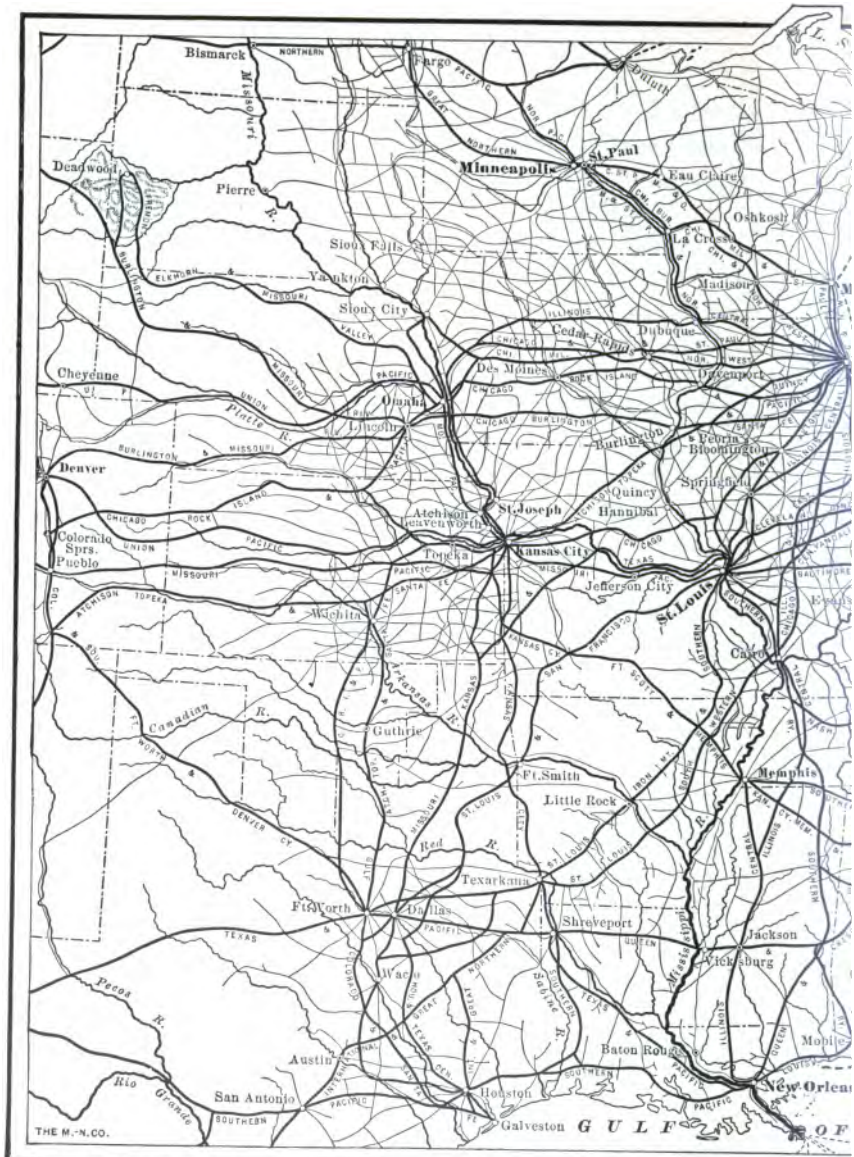
Some of the reasons why New York is the largest city of all are stated on page 123. What are they? Trace the route of the New York Central Railway (Fig. 395) and the Erie Canal to Lake Erie (Fig. 360). Name the principal cities on this route. There are other railways from New York to BUFFALO (Fig. 395), and these connect with lines that extend to Chicago and the West. The importance of Buffalo as a shipping point is further increased by the fact that Niagara Falls have made it the

eastern terminus of much of the lake traffic. Since the Welland Ship Canal (Fig. 360) now permits lake boats to pass from the Great Lakes down the St. Lawrence, why does not Montreal rival New York in importance? BOSTON has excellent railway connections with Albany and the West, but it is much smaller than New York. Why?

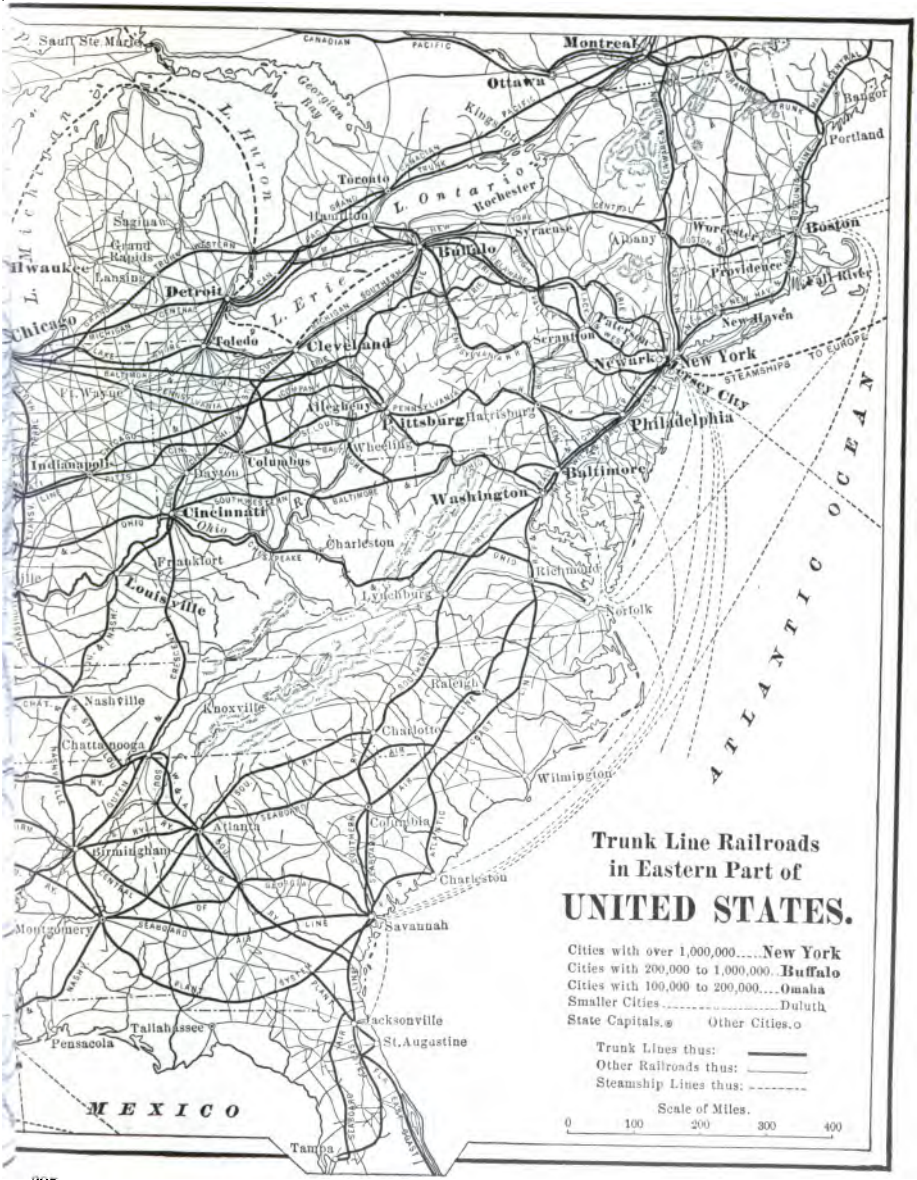
Name the chief cities along the Great Lakes between Buffalo and Duluth. Considering the raw materials at hand, what shipping and manufacturing industries must be prominent in these cities? Taking CLEVELAND, for example, state clearly the advantages of its location for securing raw products needed in manufacturing, and for shipping manufactured articles. In what respects are DETROIT, CHICAGO, and MILWAUKEE favorably located?

In Figure 394 note that from DULUTH, MINNEAPOLIS, and ST. PAUL two trunk lines of railway, the Great Northern and the Northern Pacific, extend to the Pacific coast. In what cities do they terminate? What states do they cross; and what cities have you studied that are situated on or near them?

PHILADELPHIA and BALTIMORE, like Boston and New York, also have excellent connection with the West, by lines running through PITTSBURG, COLUMBUS, INDIANAPOLIS, and CINCINNATI to CHICAGO and ST. LOUIS (Fig. 395). From the two last cities two other trunk lines, — the Atchison, Topeka, and Santa Fé, and the Union Pacific, which connects with the Southern Pacific and the Oregon Short Line, — have been built to the Pacific coast (Fig. 394). Through what states and large cities do they pass? Note the number of trunk lines extending to DENVER and other Colorado cities; several of these connect


Bismarck
Fargo
Duluth
Deadwood
Pierre
Minneapolis
St. Paul
Eau Claire
Oshkosh
La Crosse
Sioux Falls
Yankton
Madison
Sioux City
Cedar Rapids
Dubuque
Cheyenne
Des Moines
Davenport
Omaha
Lincoln
Peoria
Bloomington
Burlington
Denver
Quincy
Springfield
Atchison
Leavenworth
St. Joseph
Hannibal
Colorado Sprs.
Pueblo
Kansas City
Topeka
Jefferson City
St. Louis
Wichita
Carondelet
Arkansas R.
Canadian R.
Guthrie
Memphis
Ft. Smith
Little Rock
Red R.
Texarkana
Ft. Worth
Dallas
Shreveport
Jackson
Vicksburg
Waco
Pecos R.
Austin
Baton Rouge
Mobile
Rio Grande
San Antonio
Houston
Galveston
GULF
THE M.-N.CO.

Fi


Trunk Line Railroads
in Eastern Part of
UNITED STATES.
Cities with over 1,000,000.....New York
Cities with 200,000 to 1,000,000..Buffalo
Cities with 100,000 to 200,000....Omaha
Smaller Cities.....Duluth
State Capitals.⊛ Other Cities.○
Trunk Lines thus:
Other Railroads thus:
Steamship Lines thus:
Scale of Miles.
0 100 200 300 400
ATLANTIC OCEAN
MEXICO
Sault Ste. Marie
Montreal
Ottawa
Kingston
Toronto
Hamilton
Rochester
Syracuse
Albany
Worcester
Boston
Bangor
Portland
Providence
Fall River
New Haven
Buffalo
Saginaw
Grand Rapids
Lansing
Detroit
Toledo
Cleveland
Chicago
Ft. Wayne
Allegheny
Pittsburg
Harrisburg
Scranton
Paterson
Newark
New York
Jersey City
Philadelphia
Baltimore
Washington
Wheeling
Columbus
Dayton
Indianapolis
Cincinnati
Ohio
Charleston
Frankfort
Louisville
Lynchburg
Richmond
Norfolk
Raleigh
Nashville
Knoxville
Chattanooga
Charlotte
Wilmington
Atlanta
Columbia
Birmingham
Charleston
Montgomery
Savannah
Jacksonville
St. Augustine
Tallahassee
Pensacola
Tampa
L. Huron
L. Michigan
L. Ontario
L. Erie
Georgian Bay
Milwaukee
STEAMSHIPS TO EUROPE

PORTLAND. Name the states and chief towns along that route. Find OAKLAND (Fig. 363) which is the terminus of railways leading to San Francisco, much as JERSEY CITY and HOBOKEN are of railways leading to New York.

FIG. 397.

It is evident that the main railways of the United States extend east and west. On the other hand, Figure 396 shows that the principal navigable rivers flow southward. Name them. Why should not our principal railways likewise run north and south?

Government. — All together there are forty-five states in our Union, besides four territories (Arizona, Indian Territory, New Mexico, and Oklahama), the District of Columbia, and several outlying territories and dependencies. These are all firmly united under a free, popular government, or Republic, with the capital at WASHINGTON in the District of Columbia. This city, unlike our other large

cities, is almost entirely occupied with the affairs of government, instead of with manufacturing and commerce.

Outlying Territories and Dependencies of the United States

Alaska. — Alaska was purchased from Russia in 1867. Give its latitude. Describe the surface (Fig. 356). How must the Japan Current (p. 46) and the prevailing westerlies (Fig. 30) affect its climate? In the shallow waters near the coast, cod and halibut abound, and salmon are caught in the rivers. Seals, valuable for their fur, are captured on the Pribilof Islands. Locate these islands (Fig. 357); also the Aleutian Islands (Fig. 241). Recently gold mining has become important at various places, especially in the Klondike region of Canada on the upper Yukon (Fig. 398). There are very large gold mines at JUNEAU near SITKA, the capital.

Cuba and Porto Rico. — As a result of the war of 1898, Porto Rico was ceded by Spain to the United States, and Cuba was given its independence under the general guidance of the United States. Since these islands have a mountainous surface, and are in the trade-wind belt, how must their rainfall be distributed? (p. 33). While there are valuable forests, farming is the chief industry. Sugar (Fig. 383) and tobacco are the leading crops, and coffee (Fig. 425), cocoa, tea, and tropical fruits are other products. By far the largest city is HAVANA, the capital of Cuba (Fig. 400); SAN JUAN is the capital and largest city of Porto Rico (Fig. 400).

Hawaiian Islands. — Locate these islands (Fig. 338), which are volcanic in origin. What can you tell about

their climate? Sugar is their principal crop (Fig. 383), and coffee, rice, and tropical fruits are other products. The Pacific coast cities are their chief markets, and SAN FRANCISCO refines much of their sugar. Name the chief city (Fig. 338). The islands constitute a territory of the United States similar to Alaska.

Guam and Samoa. — These islands (Fig. 338) are of value to us mainly as coaling stations. What does that mean? Only Tutuila among the Samoan Islands (p. 484) belongs to us.

Philippine Islands. — In what latitude do these islands lie? (Figs. 241 and 338). They form a portion of the great girdle of mountain chains and volcanoes shown in Figure 5. The winter season is dry, but the summer monsoon (p. 36) brings heavy rains. What must the temperature be? The extensive forests and mineral deposits are little utilized, but hemp, tobacco, sugar, coffee, and cocoa are raised for export.

COUNTRIES NORTH OF THE UNITED STATES

Canada and Newfoundland. — The Dominion of Canada was formed in 1867. It now consists of seven provinces. Name the seven provinces and the sparsely settled territories (Fig. 398). Canada is a dependency of Great Britain, and has a popular government of its own, with OTTAWA as the capital. Newfoundland never joined this union, and hence forms a separate British colony.

Southern Canada is very similar to northern United States in physiography, climate, and products. Farther north there is a forest belt inhabited mainly by Indians and trappers; and beyond that are extensive tundras, or

ARCTIC OCEAN
Baffin Bay
GREENLAND
ATLANTIC OCEAN
PACIFIC OCEAN
HUDSON BAY
DOMINION OF CANADA
AND NEWFOUNDLAND.
Cities with over 100,000 : . . . . Toronto
Cities with 50,000 to 100,000 : . . . Hamilton
Other Cities : . . . . . Port Arthur
Capitals with less than 50,000 : . . . Regina
Capitals of Countries : ✪ Capitals of Provinces : ⊛ Other Cities : •
0 200 400 600 Miles.
Comparative Area.
PENN. 45,215 Square Miles.
Longitude West 100° from Greenwich
MACKENZIE
ASSINIBOIA
SASKATCHEWAN
ALBERTA
MANITOBA
ONTARIO
QUEBEC
LABRADOR
NEWFOUNDLAND
NEW BRUNSWICK
NOVA SCOTIA
PRINCE EDWARD I.
YUKON
Winnipeg
Regina
Toronto
Montreal
Ottawa
Quebec
Boston
New York
Chicago
Detroit
Buffalo
Hudson Strait
Davis Strait
Baffin Land
THE M.-N. CO.

FIG. 398.

barrens, having almost no inhabitants with the exception of a few Eskimos along the coast. Locate the four largest rivers and the three largest lakes.

The *forests* are one of the greatest sources of wealth, and many of the cities have sawmills, furniture factories, pulp mills, etc.; for example, FREDERICTON and ST. JOHN in New Brunswick, and MONTREAL, OTTAWA, and TORONTO farther west.

Fishing is an important industry, especially along the eastern coast (Fig. 369). Some of the best-known ports are YARMOUTH and HALIFAX in Nova Scotia, and ST. JOHN'S in Newfoundland. Vessels from the latter port are engaged in *sealing* and *whaling*. The seals on the eastern side of Canada are of value for their fat, or blubber, and not for their fur.

Wheat and *hardy fruits* are raised in British Columbia, as in the state of Washington, which has a similar climate. Farther east *cattle* and *sheep raising* are the main industries, as in Montana. Manitoba is noted for *wheat*, and WINNIPEG is a wheat centre, like Minneapolis. The best agricultural section is in Ontario. In this province, which contains nearly one-half of the inhabitants of Canada, the best farming land and the most people are found in the peninsula which extends southward between Lake Huron and Lakes Erie and Ontario. Name the large cities in this peninsula. The lakes so temper the climate that *grapes* and *peaches* flourish as in New York. Also quantities of *grain* are produced, and many *cattle*, *sheep*, *horses*, and *hogs* are raised. There is other good farm land along the St. Lawrence and in New Brunswick, Prince Edward Island, and Nova Scotia.

The Klondike region of Canada, noted for *gold*, has

already been mentioned (p. 515), and there are many other mineral deposits, including *iron ore*, *copper*, and *coal*. The most important coal mines are found on Cape Breton Island, a part of northern Nova Scotia, where there is also *iron manufacturing*.

The main water outlet for Canada is by the way of the Great Lakes and the St. Lawrence River, with large ship canals around the rapids. Name the chief cities along this route. What is the corresponding outlet in the United States? Why is the population along one route much greater than that along the other? MONTREAL is at the head of navigation to ocean vessels, since there are rapids in the river just above it. Its commerce is therefore greater than that of QUEBEC; and because so many raw products can be brought cheaply by water, it is a manufacturing centre as well. Among the articles made there are sugar, boots and shoes, cotton and woollen goods, and iron and steel goods. OTTAWA, the capital of Canada, is situated where there are falls in the Ottawa River. The situation of TORONTO is especially favorable to manufacturing. How?

The greatest railway in Canada is the Canadian Pacific (Fig. 394), which extends from ST. JOHN, New Brunswick, where there is a good harbor, to VANCOUVER on the Pacific coast. Name the principal towns along the route. Locate VICTORIA on Vancouver Island. The Canadian Pacific railway offers the shortest route from England to China and Japan, and much freight is sent that way.

Islands north of North America. — These islands have very few inhabitants, and those mainly *Eskimos*. Tell how they live. Note the country to which *Greenland* belongs (Fig. 357). Tell about the icebergs that break off from the Greenland glaciers.

Countries South of the United States

Mexico. — The physiography of Mexico recalls that of Spain, since the interior is a table-land crossed by mountains with low land along the coast. The rivers have rapids and falls, and most of them are quite short. Why? Name the two principal peninsulas. In what wind belts does Mexico lie? (Fig. 25). What follows about the distribution and quantity of rain? (Fig. 26; also pp. 31–34). What can you say about the temperature, remembering the different elevations of land?

Mexico is a republic composed of several states, with Mexico City as the capital. Spanish is the language of the country, which formerly belonged to Spain. Since the Spanish settlers freely intermarried with the Indians, many of the citizens are half-breeds; there are also pure-blooded Spaniards, semi-civilized Aztecs, and, in remote districts, tribes of savage Indians.

On the arid plateau, wherever the mountain streams make irrigation possible, *wheat*, *corn*, *beans*, and the *fruits* of the temperate zone are raised. The *maguey*, or *agave*, a plant of the arid regions, is extensively cultivated for its juice — which is made into the common drink called *pulque* — and for its fibre. *Grazing* is an important industry, as in western Texas.

On the damp coastal plains, *sugar cane*, *cotton*, and *tropical fruits* are grown; and upon the slopes between these plains and the table-land, *tobacco* and *coffee* (Fig. 425; also p. 116) are raised. In southern Mexico there are dense tropical forests containing valuable woods, such as *mahogany* and *rosewood*. Other products are *pepper*, *sarsaparilla*, and *vanilla*.

It was the mines that attracted the Spaniards to Mexico, and that country still produces such an amount of *silver* that it ranks first among silver-producing regions (Fig. 416). Large areas have never been carefully explored for ore, and in many of the mines, operated by Mexicans, very primitive methods are employed.

FIG. 399.
A map of Central America.

MEXICO CITY is the largest city, having a population of 350,000. Since good harbors are wanting, owing to the rising land (p. 488), VERA CRUZ is the only important port. There is *almost no manufacturing* in Mexican cities. Why?

Central America. — This mountainous region has several active volcanoes and is often disturbed by earthquakes. In fact, because of the frequent shocks it has been necessary to change the sites of some of the large cities. Name the five republics (Fig. 399). Their population is similar in origin to that of Mexico, and there are frequent revolutions, as in South America. Point out the British colony of British Honduras, or Belize.

What about the temperature and rainfall (Fig. 26) of Central America? A large portion of the land is covered with tropical forests containing valuable woods and the *rubber tree* (p. 115). As in Mexico, *coffee* is raised on the hill slopes in the shade of the forest trees, one of the most important sections for this industry being Guatemala (Fig. 426). *Bananas*, *sugar*, *tobacco*, *indigo*, and *cocoa* are other products. The largest city is GUATEMALA with seventy thousand inhabitants.

Nicaragua is of special interest to us on account of the proposed *Nicaragua Canal*, favored in our country in preference to the Panama Canal (p. 132). The Nicaragua route is longer than the Panama route, but a part of the distance is occupied by a lake, and the elevation necessary to be passed over is only half as great as that for the Panama Canal.

Islands. — From Yucatan to Florida a chain of islands, called the *West Indies* or *Antilles*, extends to the mouth of the Orinoco River, thus enclosing the Caribbean Sea (Fig. 400). Why the name West Indies? To what extent do they lie within the tropics? What about their winds and rainfall? Two of the larger ones have already been treated (p. 515). *Jamaica*, the third in size, is a British colony. Name its capital. The inhabitants are mainly negroes engaged in raising *sugar cane*, *early vegetables*, and *tropical fruits*.

Haiti, next to Cuba in size, is composed of two independent negro republics. Name their capitals. Much of the land is forest covered, and agriculture is the principal occupation. The products are similar to those of the other islands. How does Haiti rank in the production of *coffee?* (Fig. 426).

Note the names of some of the *Lesser Antilles*, and also the countries to which they belong. What effect must the growing beet sugar industry of Europe (p. 288) have upon these islands, in which *sugar-cane* is the most important product?

The *Bahamas* are numerous small islands built of coral. Many *sponges* are obtained on the reefs, and *early vegetables*,

FIG. 400.

A map of the West Indies.

pineapples, *oranges*, and *cocoanuts* come from the islands. They are also a *winter resort*. Find the *Bermudas* (Fig. 356) a tiny island group in the open ocean. They form a British colony. The Bermudas are also a *winter resort*, and the inhabitants are engaged in raising *Easter lilies* and early vegetables, especially *potatoes* and *onions*, for the American market.

XXV. THE UNITED STATES COMPARED WITH OTHER COUNTRIES

Area and Population. — In spite of the vast extent of the United States, there are three empires in the Old

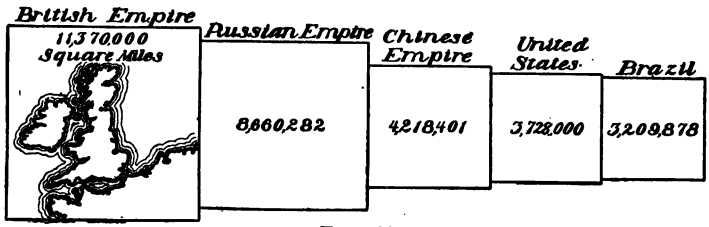


FIG. 401.
Area of the five largest nations.

World with a greater *area*. Which are they? (Fig. 401). Which country is fifth in size? Compare the United States with each of these in area.

The United States also ranks fourth in *population* (Fig. 402). Name the five most populous countries in the

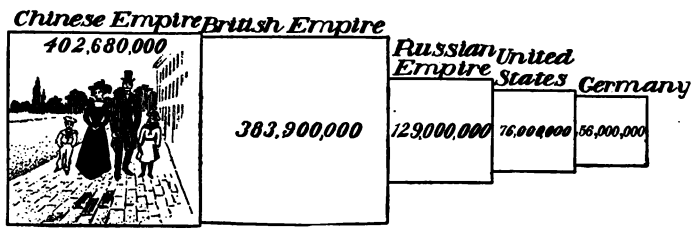


FIG. 402.
The five most populous nations, 1900.

order of their rank. What facts do you discover by comparing Figures 401 and 402? Figure 403 shows the

density of population, or the number of people per square mile, in some of the countries in the world. From this it will be seen that the United States is very thinly settled compared with many countries. Compare the United States in this regard with Belgium, England, Cuba, Mexico, and Canada.

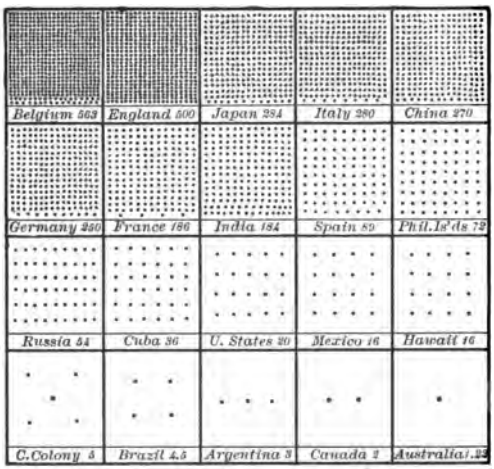


FIG. 403.
Density of population of some of the countries.

Leading Raw Products.— Nevertheless, the United States leads the world in many very important respects and approaches leadership in several others. Figure 404 shows that no nation is a

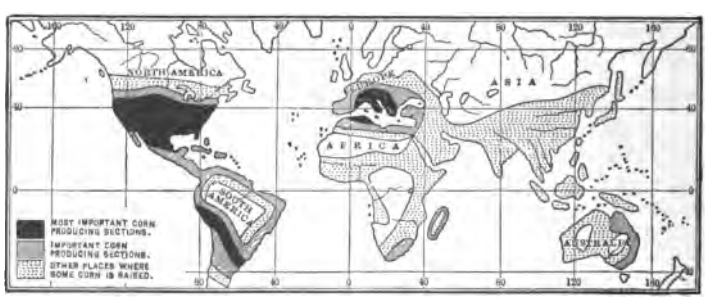


FIG. 404.
Sketch map to show the approximate distribution of corn.

close rival to us in the production of *corn*. What countries, however, raise large quantities of it? Why is no

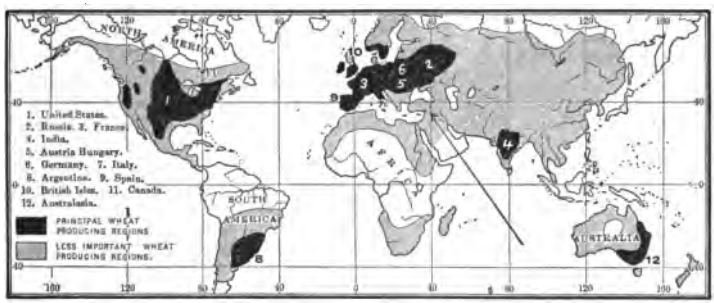


FIG. 405.
Approximate distribution of wheat.

corn raised in the British Isles? (p. 181). *Wheat* is more widely cultivated than corn (Fig. 405). Yet we are far

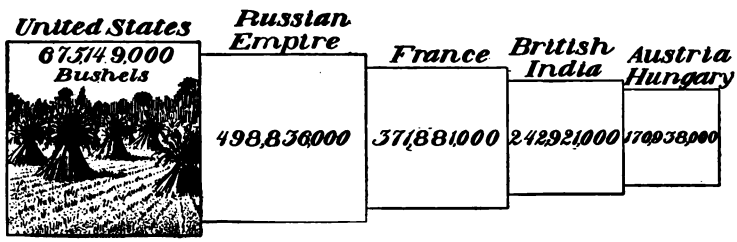


FIG. 406.
The five leading wheat-producing countries, 1898.

in the lead in that grain (Fig. 406). Point out (Fig. 405) the leading wheat fields of the world. Which sections are important for both wheat and corn? On which side of the Atlantic is wheat raised farthest north? Why?

Cotton is limited to warm climates (Fig. 407), so that comparatively few countries raise it. Name the five that lead in its production (Fig. 408). To what extent does the

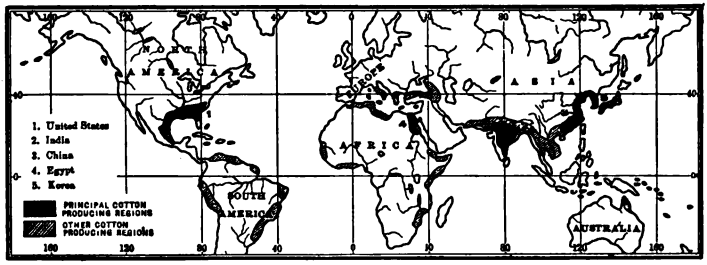


FIG. 407.
Approximate distribution of cotton.

output of the United States surpass that of the four other countries together? In what parts of the United States is most *cotton manufacturing* carried on? What other countries have important cotton-manufacturing industries?

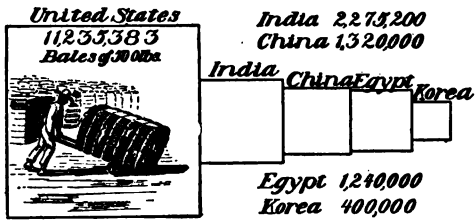


FIG. 408.
The five leading cotton-producing countries, 1898.

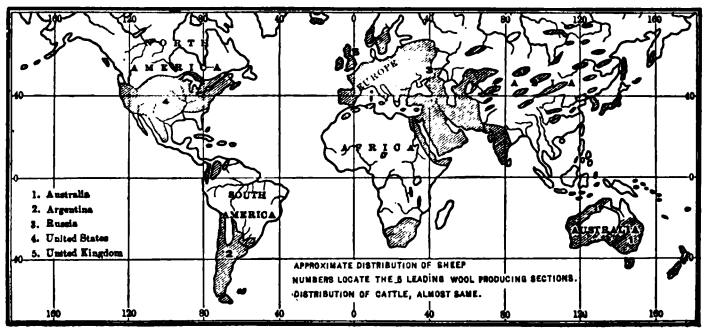


FIG. 409.
Approximate distribution of sheep.

Note the distribution of *sheep and cattle* (Fig. 409). What is our rank in the production of *wool?* (Fig. 410).

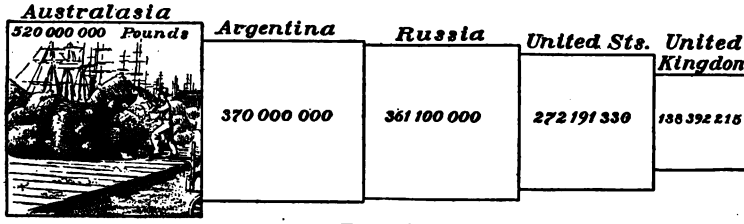


FIG. 410.
The five leading wool-producing countries, 1899.

Yet we consume much more than we raise. Recall some facts concerning sheep raising in Australia, Argentina, and the United States. What nations have important *woollen manufacturing?*

The extreme importance of *coal and iron for manufacturing* purposes has often been emphasized. But Figure

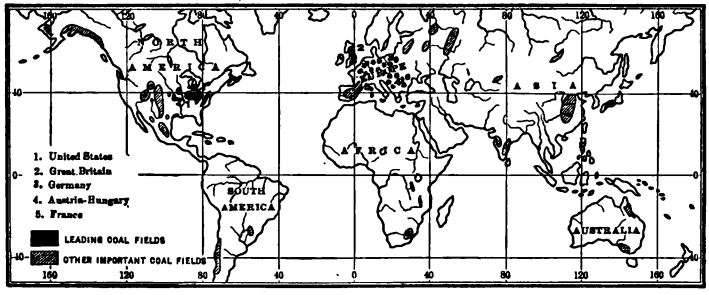


FIG. 411.
Approximate distribution of coal.

411 represents the *coal fields* as very limited. What countries have little or none? Name the leading coal-producing sections, and state the rank of the United States in this mineral (Fig. 412).

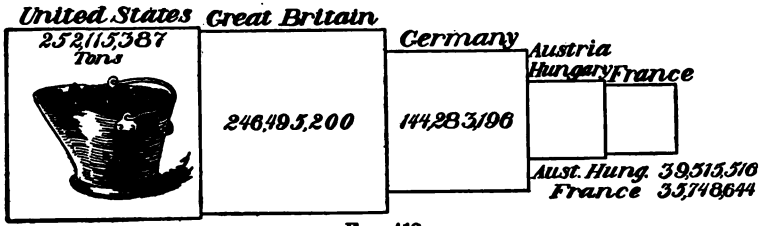


FIG. 412.
The five leading coal-producing countries, 1899.

Is *iron ore* more or less widely distributed than coal? (Fig. 413). How does the United States rank in the

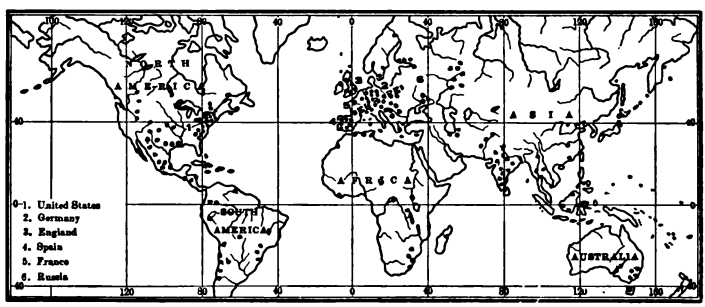


FIG. 413.
Approximate distribution of iron mines.

output of this mineral (Fig. 413); also in the production of *pig iron* (Fig. 414), which demands coal as well as

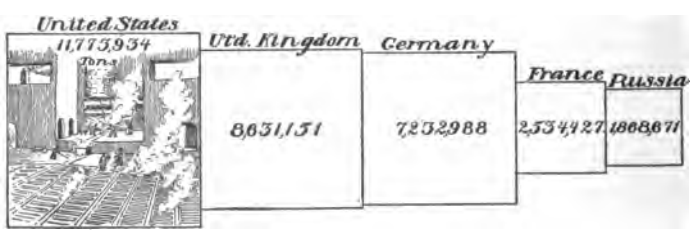


FIG. 414.
The five leading countries in the production of pig iron, 1898.

iron ore? How does the output of coal and iron correspond to the importance of countries as manufacturing nations? (Fig. 421).

Where are the principal *silver*-mining sections? (Fig. 415). And how do we compare with other countries

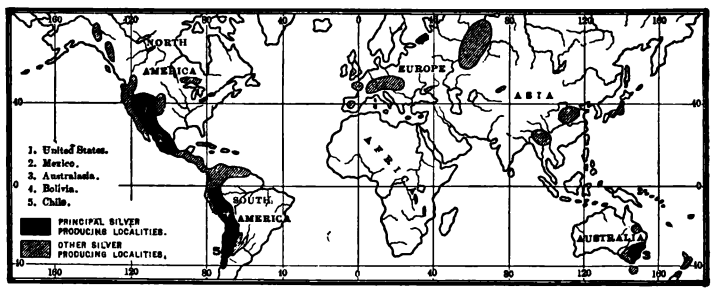


FIG. 415.
Approximate distribution of silver mining.

in this product? (Fig. 416). Notice to what extent the world is indebted to the New World for silver. Tell

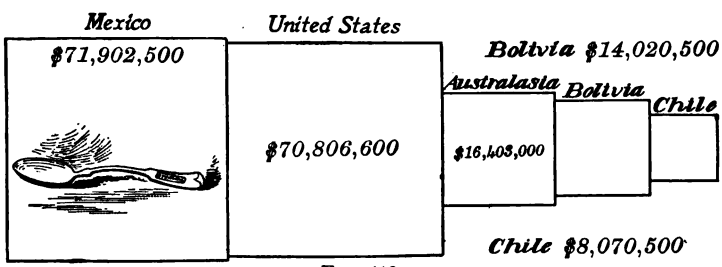


FIG. 416.
The five leading silver-producing countries, 1899.

about the distribution of *gold* (Fig. 417) and give our rank in the production of that metal (Fig. 418). How does the value of the total gold production compare with that of silver in the five leading regions for each?

Figure 419 suggests that the United States leads the world in the production of *petroleum*, or mineral oil, which

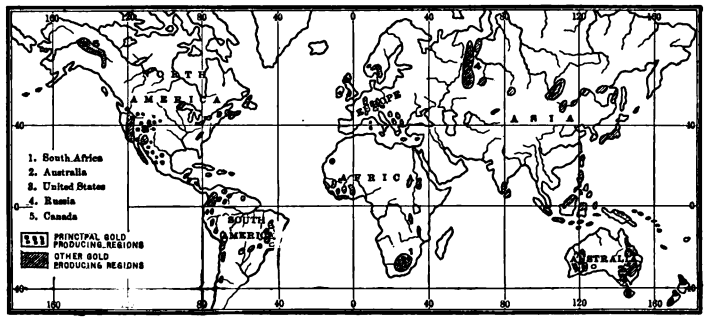


FIG. 417.

Approximate distribution of gold mining.

is true. The second most important district for petroleum is in Russia near the Caspian Sea. Other districts pro-

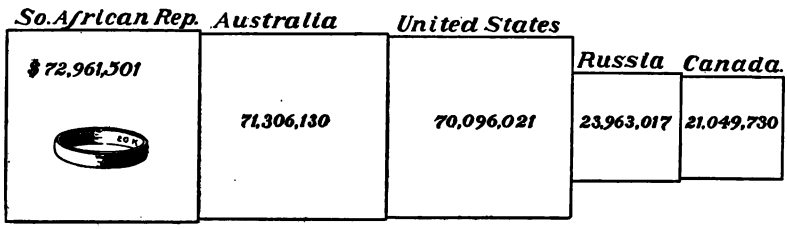


FIG. 418.

The five leading gold-producing countries, 1899.

duce little petroleum. On the same map with petroleum is shown the distribution of *rubber*. To what countries and climates is rubber confined? (Fig. 419).

Manufacturing and Commerce. — According to Figure 420 on what two continents is there the greatest development of *manufacturing?* What other smaller sections are active

in this industry? Considering the abundance of our raw materials and the energy and intelligence of our people,

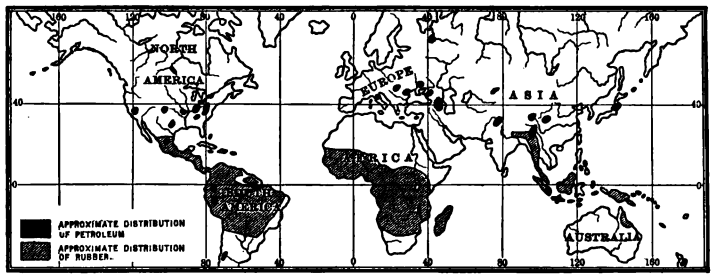


FIG. 419.

Approximate distribution of petroleum; also of rubber.

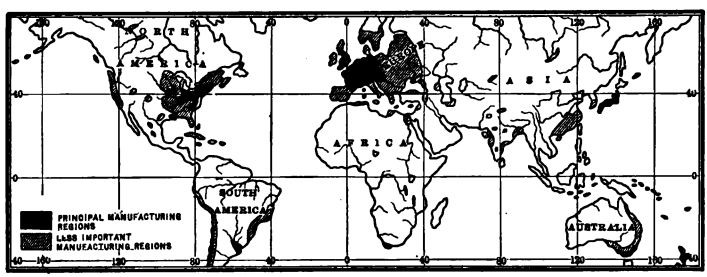


FIG. 420.

Approximate distribution of manufacturing.

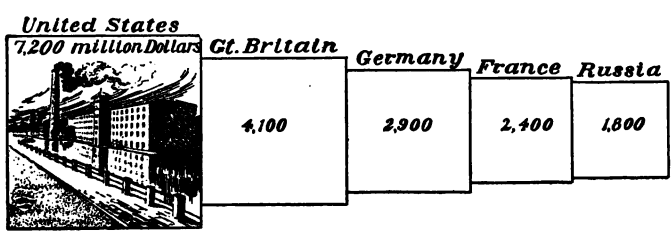


FIG. 421.

The five leading manufacturing countries, 1888.

it is not surprising that we surpass all other countries in such work (Fig. 421). State the rank of other leading nations in this occupation.

In provision for *transportation by rail* the United States also takes the leading place. It has by far the greatest number of miles of railway of any nation (Fig. 422),

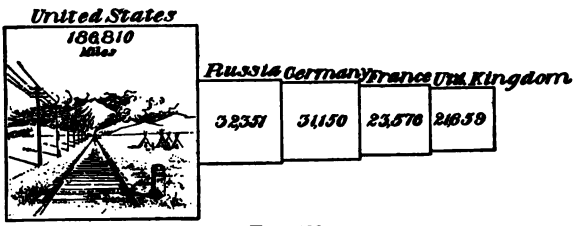


FIG. 422.
The five countries having the greatest length of railways, 1898.

though several small European countries have a greater development of railways in proportion to their area. The United States ranks second in provision for *transportation by water* (Fig. 423). State the rank of the five

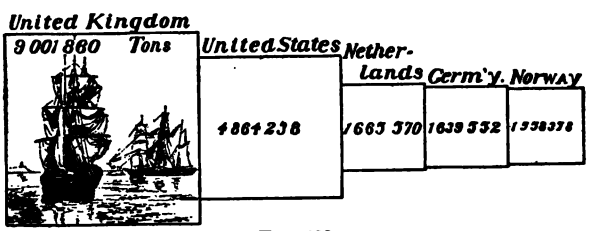


FIG. 423.
The five countries having the largest merchant marine, 1898.

chief countries in total length of *railways*, and in *merchant marine*. Give reasons why the United Kingdom should lead in merchant marine (p. 201). Why should Norway be of importance in this respect? (p. 255).

All these facts prepare us for Figure 424, which shows that the United States is the *wealthiest nation* on the

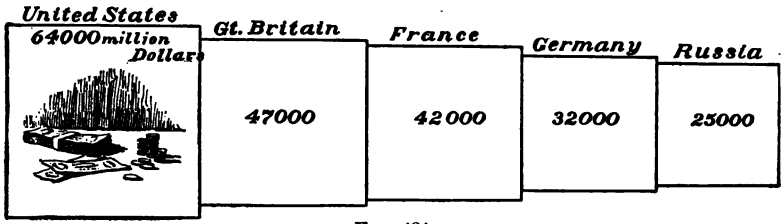


FIG. 424.

The five wealthiest nations, 1888.

face of the earth. Compare our wealth with that of other leading countries. In how many and what respects have our products and industries been shown to lead all nations of the world?

Dependence upon Other Nations. — All together the United States may be considered a wonderfully favored and independent nation, since it has such a wealth of raw products, and such an extensive development of manufacturing. We could, probably, better than any other nation, depend upon ourselves alone for all that we need, if occasion should arise. Yet so closely related are the nations of the world that if war arises between two of them, our industries and markets are affected. This is due largely to the fact that we produce far more than we need of certain commodities, as wheat, cotton, meat, and iron, for which a market must be found abroad. These we *export.* But it is also due to the fact that we are partly, or wholly, dependent upon foreign countries for certain other articles. These we *import.*

For example, Figure 425 shows that *coffee* is not grown within our states, although it is daily consumed in almost

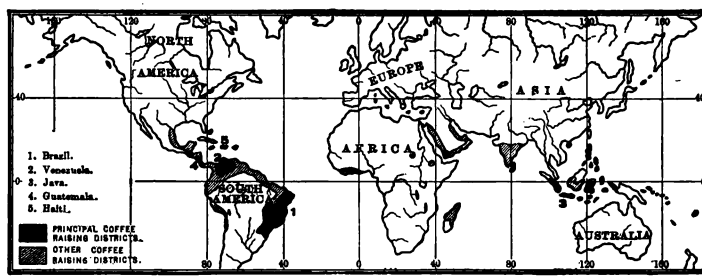


FIG. 425.
Approximate distribution of coffee.

every household. Notice, however, that it is produced in Cuba, Porto Rico, and the Philippine Islands (Fig. 425). To what climate and countries is it confined? State the rank of the principal coffee-producing sections and compare their output (Fig. 426).

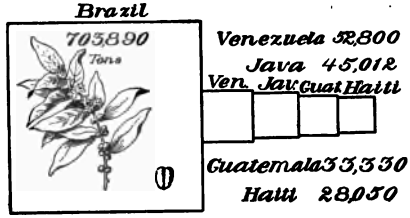


FIG. 426.
The five leading coffee-producing sections, 1899.

Note the *beet sugar* and *cane sugar* areas (Fig. 427). Also the

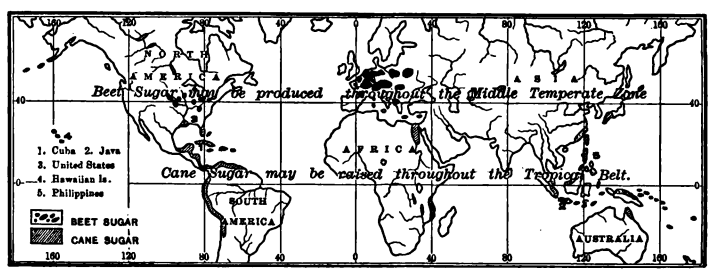


FIG. 427.
Distribution of sugar cane and beet sugar.

rank of the leading countries which manufacture cane sugar (Fig. 428). Our own states produce far less sugar

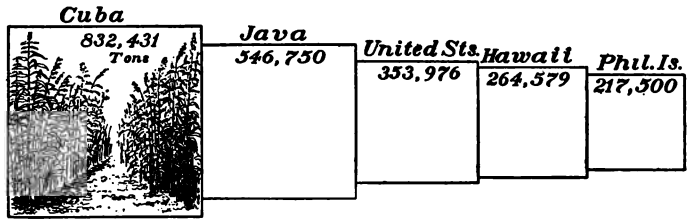


FIG. 428.

The five countries producing most cane sugar, 1898.

each year than we consume. Of what importance, therefore, in this respect is our newly established relation to Cuba and the Hawaiian and Philippine Islands?

Figure 429 represents us as depending wholly on foreign nations for raw *silk*. Name the chief silk-producing coun-

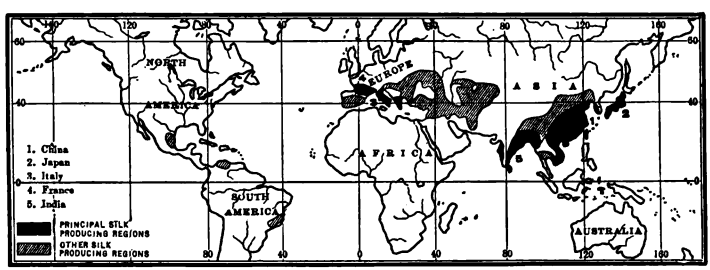


FIG. 429.

Approximate distribution of raw silk production.

tries; also compare their output (Fig. 430). Our *tea* also comes almost entirely from abroad (Fig. 431). From what region mainly? And while much *rice* is produced in our Southern States (Fig. 432), a large amount has to be

imported. From what sources must it be obtained? We have, therefore, a very extensive trade in *imports* as well as in *exports*.

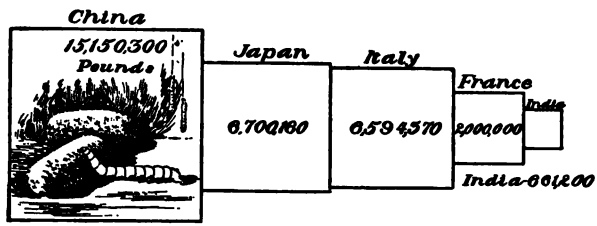


FIG. 430.

The five leading raw silk-producing countries, 1899.

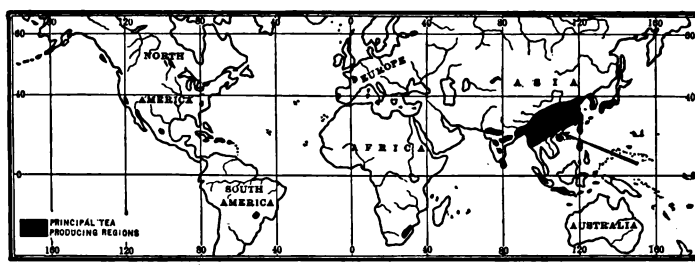


FIG. 431.

Approximate distribution of tea.

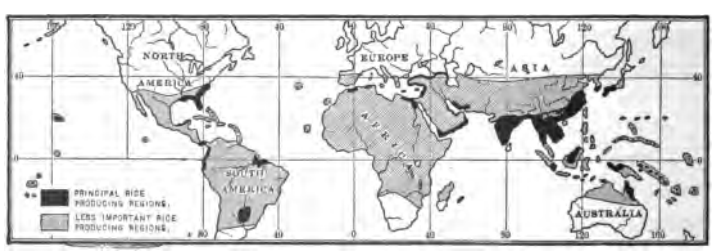


FIG. 432.

Approximate distribution of rice.

Exports and Imports. — Our ten leading exports, named in order of value, together with the principal countries to which the goods are sent, are as follows: —

Articles	Value in 1900	Principal Countries to which they are sent
1. Cotton (mainly unmanufactured)	$265,836,000	Gt. Britain, Germany, France, Japan.
2. Breadstuffs (wheat, corn, flour, etc.)	262,744,000	Gt. Britain, Germany, Netherlands, Belgium.
3. Meat and dairy products	184,453,000	Gt. Britain, Germany, France, Belgium.
4. Iron and steel, and manufactures of	121,914,000	Gt. Britain, Canada, Germany, Mexico.
5. Mineral oils	75,612,000	Gt. Britain, Germany, Netherlands, Belgium.
6. Copper (mainly manufactures of)	57,853,000	Gt. Britain, Netherlands, France, Germany.
7. Wood, and manufactures of	50,598,000	Gt. Britain, Canada, Germany, W. Indies.
8. Animals (mainly cattle)	43,585,000	Gt. Britain.
9. Tobacco	35,433,000	Gt. Britain, Germany, Italy, France.
10. Leather, and manufactures of	27,293,000	Gt. Britain, Australasia, Canada.
Total value of exports	$1,394,484,000	

The ten leading imports, on the other hand, are as follows: —

Articles	Value in 1900	Principal Countries from which they come
1. Sugar and molasses	$101,141,000	E. Ind., Hawaiian Isds., Cuba, Germany (beet sugar).
2. Silk, and manufactures of	76,224,000	Japan, France, China, Italy.
3. Hides and skins	57,936,000	E. Indies, S. America, Gt. Britain, France.
4. Fibre, and manufactures of	57,933,000	Mexico, Philippines, E. Indies.
5. Chemicals, drugs, etc.	53,705,000	Germany, E. Indies, Gt. Britain.
6. Coffee	52,468,000	Brazil, Cent. America, E. Indies, Mexico.
7. Cotton (mainly manufactures of)	49,502,000	Gt. Britain, Germany, Switzerland, France.
8. Wool, and manufactures of	36,425,000	Gt. Britain, Germany, France, S. America.
9. Rubber and rubber goods	33,860,000	Brazil, Gt. Britain.
10. Fruits and nuts	19,264,000	Italy, Cent. America, W. Indies.
Total value of imports	$849,941,000	

In Figure 433 trace the main *steamship lines* of the world by which these goods are carried. Compare the value

and nature of our exports and imports. How is the result encouraging?

More than one-third of all our foreign trade is with the British Isles, the ten leading countries ranking as follows: —

THE LEADING TEN COUNTRIES WITH WHICH THE U.S. TRADES

Countries		Value in 1900	Kinds of Goods
1. British Isles	Exp.	$533,820,000	Provisions, breadstuffs, raw cotton.
	Imp.	159,582,000	Cotton goods, raw wool, tin, jewellery,
	Total	693,402,000	rubber goods.
2. Germany	Exp.	187,348,000	Raw cotton, breadstuffs, provisions.
	Imp.	97,375,000	Beet sugar, chemicals and drugs, cot-
	Total	284,723,000	ton goods, silk goods.
3. France	Exp.	83,335,000	Raw cotton, copper, mineral oil.
	Imp.	73,012,000	Silk goods, hides, jewellery, cotton
	Total	156,347,000	goods.
4. Canada	Exp.	97,337,000	Coal, breadstuffs, cotton and manu-
			factures of.
	Imp.	39,932,000	Lumber, coal, hides.
	Total	137,269,000	
5. Netherlands	Exp.	89,387,000	Breadstuffs, provisions, copper, min-
			eral oil.
	Imp.	15,853,000	Jewellery, tin.
	Total	105,240,000	
6. West Indies	Exp.	48,561,000	Provisions, breadstuffs, animals.
	Imp.	52,562,000	Sugar, fruits, cocoa.
	Total	101,123,000	
7. East Indies	Exp.	6,634,000	Mineral oil, cotton goods.
	Imp.	73,243,000	Sugar, hides, tin.
	Total	79,877,000	
8. Brazil	Exp.	11,578,000	Breadstuffs, mineral oil, provisions.
	Imp.	58,073,000	Coffee, rubber, sugar.
	Total	69,651,000	
9. Mexico	Exp.	34,975,000	Coal, cotton goods, iron and steel
	Imp.	28,646,000	manufactures.
	Total	63,621,000	Sisal grass, coffee, lead, hides.
10. Japan	Exp.	29,087,000	Manufactured cotton, mineral oil, iron
			and steel manufactures.
	Imp.	32,749,000	Silk, tea.
	Total	61,836,000	

Name some of the countries which probably have the same exports as the United States, and which are, therefore, likely to be active rivals to us in supplying foreign markets.

Owing to our trade relations with the United Kingdom, what hardships would probably be brought upon the British if they entered upon a war with us? How might the Germans

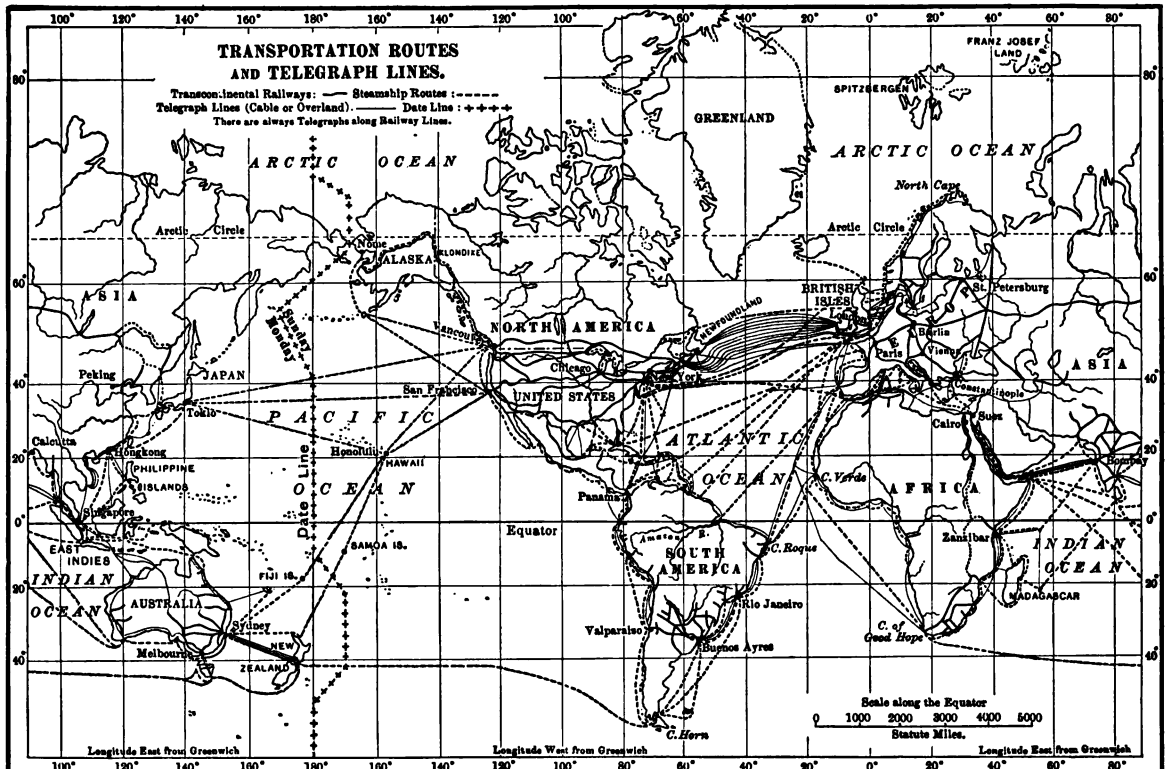

TRANSPORTATION ROUTES
AND TELEGRAPH LINES.
Transcontinental Railways: —— Steamship Routes :- - - - -
Telegraph Lines (Cable or Overland). ——— Date Line : + + + +
There are always Telegraphs along Railway Lines.
ARCTIC OCEAN
GREENLAND
FRANZ JOSEF LAND
SPITZBERGEN
North Cape
Arctic Circle
Nome
ALASKA
KLONDIKE
ASIA
NORTH AMERICA
Vancouver
Winnipeg
NEWFOUNDLAND
BRITISH ISLES
London
St. Petersburg
Berlin
Paris
Vienna
Constantinople
Suez
Cairo
Peking
JAPAN
San Francisco
Chicago
UNITED STATES
Tokio
PACIFIC
Calcutta
Hongkong
PHILIPPINE ISLANDS
Singapore
EAST INDIES
INDIAN OCEAN
AUSTRALIA
Sydney
Melbourne
NEW ZEALAND
Honolulu
HAWAII
Date Line
FIJI IS.
SAMOA IS.
Panama
Equator
ATLANTIC OCEAN
C. Verde
AFRICA
Bombay
Zanzibar
MADAGASCAR
C. of Good Hope
C. Roque
SOUTH AMERICA
Rio Janeiro
Valparaiso
Buenos Ayres
C. Horn
Scale along the Equator
0 1000 2000 3000 4000 5000
Statute Miles.
Longitude East from Greenwich
Longitude West from Greenwich
Longitude East from Greenwich

FIG. 433.

suffer if they were at war with us? How might the French suffer? On the other hand, what hardships would come to us in each case? Are we more or less independent than these countries in case of such war? Why?

Reasons for the Rank of the United States. — The preceding figures and diagrams show that several European countries are the chief competitors with the United States in the *world's trade*. Give examples. But so far as the future is concerned, several important facts are in our favor. In the first place, we are still in our youth as a people, while some of the leading nations of Europe have perhaps already reached the zenith of their power. In the second place, the territory of most of those countries is densely populated, as shown in Figure 403. Note the number of inhabitants per square mile in Belgium, Germany, and France. When we contrast with these figures our average of only twenty persons per square mile, the possibility of our future growth seems almost without limit. Immense tracts of land, which in Europe would be carefully tilled, are in our country not even cleared for pasture; and in no large section of the United States do we even approach the careful hand tillage of Belgium and some other European countries.

Another point in our favor is the varied climate and physiography of our vast country, encouraging varied products. Almost all farm products can be raised with little care in our rich soil and favorable climate. Add to this the wonderful mineral resources, which are apparently not equalled on any continent, and it will be seen that our natural resources, which have made present development possible, promise equally for the future.

Our people are another element to be considered in

reckoning past success and future promise. They have consisted, in large part, of those who had energy and ambition enough to migrate to a new land in the hope of bettering their condition. In their new home the possibilities have been so great that they have been encouraged to work and to improve themselves. As the environment of the desert has given rise to the nomad, and the ease of life in the tropical forest to the degenerate savage, so the environment in the United States has given rise to a race noted for its energy and enterprise. This race has been possible, however, largely by reason of the fact that it comes from a mixture of peoples already gifted. That resources alone will not make an energetic people and a great nation is well illustrated in China, where nature favors, but racial characteristics and customs are opposed to development.

Nor would the statement of reasons for the present position of the United States and her future prospects be complete if left here. There are two other elements of high importance; namely, education and government. Where people are hampered by ignorance, petty restrictions, and heavy taxes, unnecessarily imposed upon them by their rulers, they have little opportunity for progress. It is those European countries in which there are the best opportunities for education and the greatest freedom, that have made the greatest progress. And no nation in the world pays more attention to education, or guarantees its people a more active part in their entire government, than the United States.

APPENDIX I

REFERENCES TO BOOKS, ARTICLES, ETC.

PUBLISHING HOUSES. American Book Co., New York (A. B. C.); D. Appleton & Co., New York (App.); The Century Co., New York (Cent.); Educational Publishing Co., Boston (E. P. C.); Harper & Bros., New York (H. B.); Houghton, Mifflin & Co., Boston (H. M. C.); The Macmillan Co., New York (McM.); G. P. Putnam's Sons, New York (Put.); Charles Scribner's Sons, New York (Scrib.); Silver, Burdett & Co., Boston (S. B. C.).

MAGAZINES. *Century Magazine* ($0.35 each number), New York (*Cent. Mag.*); *Cosmopolitan* ($0.10 each), Irvington, N.Y. (*Cos.*); *Chautauquan* ($0.25 each), Meadville, Pa. (*Chaut.*); *Harper's Magazine* ($0.35 each), New York (*H. M.*); *Journal of School Geography* ($0.15 a number, $1.00 a year), Lancaster, Pa. (*J. S. G.*); *National Geographic Magazine* ($0.25 a number, $2.00 a year. Includes membership to Society), Washington, D.C. (*N. G. M.*); *Scribner's Magazine* ($0.25 each), New York (*S. M.*).

In referring to magazines, the volume is given first, the page last; thus, May, 1891, *Volume* 6, *page* 75 = *May*, '91, 6:75.

General. Many of the references in the First Book and some of those in the Second Book — for example, references to books on Physiography and the Philippines — would serve for this volume also. It is not, of course, expected that schools will find it possible to obtain all or even a large proportion of those mentioned. These lists, which could easily be multiplied to many times their present size, are offered merely as suggestions to aid those teachers who wish to have a good working library. Many good books are omitted from them, either because of their cost or for other reasons. At the end of each section of Mill's "International Geography" are references to good standard books. See also Mill, "Hints to Teachers, etc., on the Choice of Geographical Books" (Longmans, Green & Co., New York, $1.25).

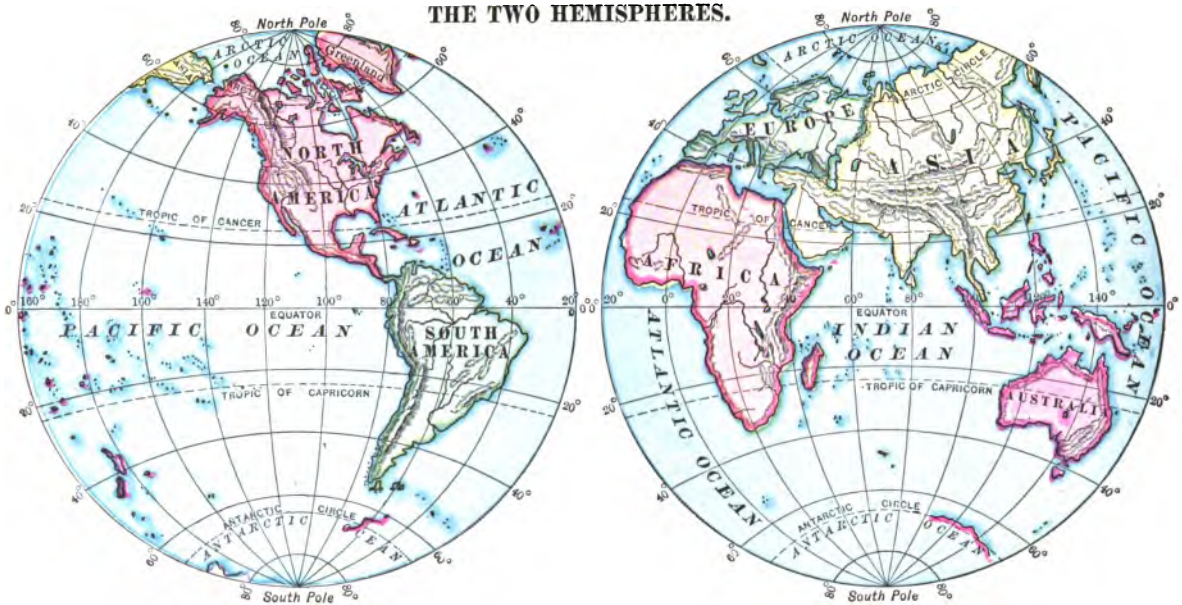

THE TWO HEMISPHERES.
North Pole
ARCTIC OCEAN
Greenland
NORTH AMERICA
ATLANTIC OCEAN
TROPIC OF CANCER
EQUATOR
PACIFIC OCEAN
SOUTH AMERICA
TROPIC OF CAPRICORN
ANTARCTIC CIRCLE
ANTARCTIC OCEAN
South Pole
EUROPE
ASIA
PACIFIC OCEAN
AFRICA
INDIAN OCEAN
AUSTRALIA
ATLANTIC OCEAN

FIG. 434.

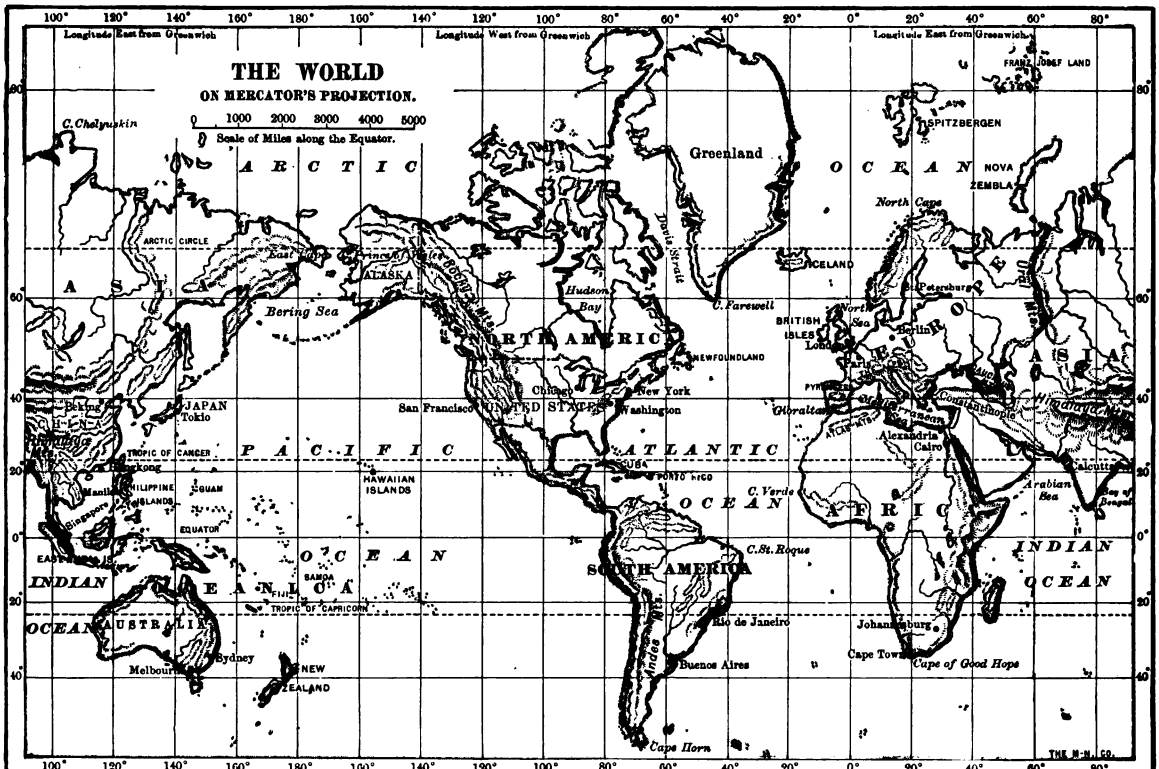

THE WORLD
ON MERCATOR'S PROJECTION.
0 1000 2000 3000 4000 5000
Scale of Miles along the Equator.
Longitude East from Greenwich
Longitude West from Greenwich
Longitude East from Greenwich
C. Chelyuskin
ARCTIC
ARCTIC CIRCLE
ASIA
Bering Sea
ALASKA
Rocky Mts.
Hudson Bay
NORTH AMERICA
Greenland
Davis Strait
C. Farewell
NEWFOUNDLAND
Chicago
New York
San Francisco
UNITED STATES
Washington
JAPAN
Tokio
Peking
CHINA
TROPIC OF CANCER
Hongkong
Manila
PHILIPPINE ISLANDS
GUAM
Singapore
EQUATOR
PACIFIC
HAWAIIAN ISLANDS
ATLANTIC
CUBA
PORTO RICO
OCEAN
C. Verde
C. St. Roque
SOUTH AMERICA
Rio de Janeiro
Buenos Aires
Andes Mts.
Cape Horn
INDIAN
OCEAN
AUSTRALIA
Sydney
Melbourne
NEW ZEALAND
SAMOA
FIJI
TROPIC OF CAPRICORN
OCEAN
ICELAND
BRITISH ISLES
London
North Sea
Paris
Berlin
St. Petersburg
North Cape
SPITZBERGEN
NOVA ZEMBLA
FRANZ JOSEF LAND
EUROPE
Ural Mts.
ASIA
Constantinople
Gibraltar
Mediterranean Sea
Alexandria
Cairo
AFRICA
Johannesburg
Cape Town
Cape of Good Hope
Calcutta
Arabian Sea
Bay of Bengal
INDIAN
OCEAN
THE M-N. CO.

FIG. 435.

Among the many valuable but expensive books of reference mention may be made of Réclus' "The Earth and its Inhabitants" (App., 19 vols., $5.00 each); Stanford's "Compendiums of Geography" (Scrib., 8 vols. at $4.50 and 2 vols. at $8.40); and Baedeker's Guide Books (Scrib.), price variable. The latter may be found in the libraries of friends who have travelled abroad.

There are a number of series for young people which contain good material: For example, Butterworth, "Zigzag Journey Series" (Dana Estes & Co., Boston, 18 vols., $1.50 each); Hale, "Family Flight Series" (Lothrop Publishing Co., Boston, 5 vols., $1.50 each); Champney, "Three Vassar Girls" series (Dana Estes & Co., Boston, 11 vols., $0.75 each).

Every teacher of geography would find Mill's "International Geography," (App., $3.50) and "The Statesman's Year Book" (McM., $3.00) of inestimable value. For physiography and climate some help may be gained from Tarr, "First Book of Physical Geography" (McM., $1.10). For reference to magazines, see First Book of this series, pp. 256 and 257. Every teacher ought to have access to at least one of these magazines, and the subscription price is so low that they are accessible to all. Notice how frequently the *National Geographic Magazine* and the *Journal of School Geography* are referred to in the following lists; yet only a very few have been selected from the great number of really valuable articles. The *Bulletin, American Bureau of Geography*, also contains many valuable articles in each issue.

South America. There is a *Handbook* for each of the republics, issued by the Bureau of American Republics, Washington, D.C., price from $0.30 to $0.50 each. Ballou, "Equatorial America" (H. M. C., $1.50); Carpenter, Geographical Reader, "South America" (A. B. C., $0.60); Childs, "South American Republics" (H. B., $3.50); Curtis, "Capitals of Spanish America" (H. B., $3.50); Coe, "Our American Neighbors" (S. B. C., $0.60); President Hubbard's Annual Address, "South America" (*N. G. M.*, March, '91, 3:1); "Climatic Notes made during a Voyage around South America" (*J. S. G.*, Sept. and Oct., '98, 2:241 and 297); "A Winter Voyage through the Straits of Magellan" (*N. G. M.*, May, '97, 8: 129); "The First Landing on the Antarctic Continent" (*Cent. Mag.*, Jan., '96, 51:432); "Magellan and the Pacific" (*H. M.*, Aug., '90, 81: 357); Bates, "A Naturalist on the River Amazon" (Humboldt Library, New York, $1.00); Andrews, "Brazil, Its Conditions and Prospects" (App., $1.50); Ford, "Tropical America" (Scrib., $2.00); "The Valley of the Amazon and its Development" (*J. S. G.*, Sept., '97, 1:193); "The Argentine Capital" (*H. M.*,

March, '91, 82:491); "Argentine Provincial Sketches" (*H. M.*, Apr., '91, 82:781); "The Argentine People," etc. (*H. M.*, May, '91, 82: 863); "Patagonia" (*N. G. M.*, Nov., '97, 8:305); "The Republic of Uruguay" (*H. M.*, May, '91, 82:906); "The Republic of Paraguay" (*H. M.*, July, '91, 83:222); Rodway, "In the Guiana Wilds" (L. C. Page & Co., Boston, $1.25); Curtis, "Venezuela" (H. B., $1.25); "Venezuela: her government," etc. (*N. G. M.*, Feb., '96, 7:49); "Glimpses of Venezuela and Guiana" (*Cent. Mag.*, July '96, 52: 358); Whymper, "Travels amongst the Great Andes of the Equator" (Scrib., $2.50); "Across the Andes" (*H. M.*, Sept., '90, 81:489); "The Ascent of Illimani" and "Climbing Mount Sorata" (*H. M.*, Oct. and Nov., '99, 99. 657 and 863); "The Road to Bolivia" (*N. G. M.*, June and July, 1900, 11:209 and 264); "A Journey in Ecuador" (*N. G. M.*, July, '96, 7:238); Pratt, "Pizarro: Conquest of Peru" E. P. C., $0.30); "Impressions of Peru" (*H. M.*, Jan., '91, 82:253); Smith, "Temperate Chile" (McM., $3.50); "The Climatic Control of Occupation in Chile" (*J. S. G.*, Dec., '97, 1:289); Articles on Chile (*H. M.*, Oct. and Nov., '90, 81:764 and 901); "A Day in the Falkland Islands" (*J. S. G.*, Feb., '98, 2:49).

Europe. Lyde, "A Geography of Europe" (McM., $0.50); Coe, "Modern Europe" (S. B. C., $0.60); Emerson, "European Glimpses and Glances" (Cassell & Co., New York, $1.00); King, "Northern Europe" (Lee & Shepard, Boston, $0.60); Davis, "The Rulers of the Mediterranean" (H. B., $1.25); "From the Black Forest to the Black Sea" (*H. M.*, Feb. to Aug., '92, Vols. 84 and 85); Lyde, "A Geography of the British Isles" (McM., $0.60); Green, "A Short Geography of the British Islands" (McM., $0.90); Davis, "Our English Cousins" (H. B., $1.25); Pratt, "Stories of England" (E. P. C., $0.40); Geikie, "The Scenery in Scotland" (McM., $3.50); Corbin, "Schoolboy Life in England" (H. B., $1.25); "The Temperature of the British Isles" (*J. S. G.*, Dec., '98, 2:361); "The House of Commons," etc. (*H. M.*, Dec., '93, 88:34); "A General Election in England" (*H. M.*, Sept., '93, 87:489); "London as seen by C. D. Gibson" (*S. M.*, Feb.–June, '97, Vol. 21); "The Geography of Greater London" (*J. S. G.*, Feb., '01, 5:41); "The Best-governed City in the World" (*H. M.*, June, '90, 81:99); "Notes on the Geography of Scotland" (*J. S. G.*, May, '98, 2:161); "From Home to Throne in Belgium" (*H. M.*, Apr., '97, 94:722); "Principal Cities of Holland" (*Chaut.*, June, '98, 27:227); "Land

Wrested from the Sea" (*Chaut.*, Aug. '95, 21 : 597); "The Picturesque Quality of Holland" (*S. M.*, 2:160; 5:162; 10:621); Macdonald, "Paris of the Parisians" (Lippincott, Philadelphia, $1.50); Davis, "About Paris" (H. B., $1.25); "Present Condition of France" (*Chaut.*, Dec., '98, 28 : 280); "Commerce and Manufactures of France" (*Chaut.*, Aug., '97, 25 : 480); "The French Army" (*H. M.*, Apr., '91, 82 : 653); Finck, "Spain and Morocco" (Scrib., $1.25); Stoddard, "Spanish Cities" (Scrib., $1.50); Stephens, "Portugal" (Put., $1.50); Loring, "A Year in Portugal" (Put., $1.50); "Up Gibraltar; to Tangier; into Spain" (*Chaut.*, Aug., '93, 17 : 515); Articles on Spanish Cities (*Cos.*, May–Sept., '96, Vol. 21); Thomas, "Sweden and the Swedes" (Rand, McNally & Co., Chicago, $3.75); Pratt, "Legends of Norseland" (E. P. C., $0.40); "A Glacier Excursion in Norway" (*Cos.*, Oct., '97, 23 : 625); Stepniak, "The Russian Peasantry" (H. B., $1.25); Stepniak, "Russia under the Tzars" (Scrib., $1.50); Greene, "Army Life in Russia" (Scrib., $1.25); "Baltic Russia" (*H. M.*, July, '90, 81 : 295); "The Czar's People" (*H. M.*, June, '98, 97 : 3); "Awakened Russia" (*H. M.*, May, '98, 96 : 817); "Finland" etc. (*H. M.*, Feb., '91, 82 : 330; "The People of the Reindeer" (Laplanders) (*Cent. Mag.*, Aug., '99, 58 : 582); Pratt, "Stories from Old Germany" (E. P. C., $0.40); "The Government of German Cities" (*Cent. Mag.*, June, '94, 48 : 296); "Some Impressions of Berlin" (*Cos.*, Jan., 1900, 28 : 315); "Impressions of Berlin" (*H. M.*, Aug., '90, 81 : 340); "Stuttgart" (*H. M.*, Jan. and Feb., '98, 96 : 269 and 382); "The German Army of To-day" (*H. M.*, May, '92, 84 : 869); "German Universities" (*Chaut.*, Aug., '96, 23 : 560); "The German Royal Family" (*Chaut.*, Sept., '96, 23 : 668); Articles on Germany (*Chaut.*, Oct., '94–Nov., '95, Vols. 20–22); Lubbock, "The Scenery of Switzerland" (McM., $1.50); "A Thousand Miles through the Alps" (*S. M.*, June, '96, 20 : 28); "Venice in Easter" (*H. M.*, Apr., '95, 90 : 738); "Italian Gardens" (*H. M.*, June and Aug., '93, 87 : 165 and 393); "The Corso of Rome" (*S. M.*, Oct., '91, 10 : 399); "St. Peter's" (*Cent. Mag.*, July, '96, 52 : 323); "The Italian Army" (*H. M.*, Aug., '92, 85 : 419); Whitman, "Austria" (Put., $1.50); "Vienna as a Type City" (*J. S. G.*, May, '99, 4 : 175); "The Tyroleans" (*Cos.*, Sept., '98, 25 : 487); "The Banderium of Hungary" (*S. M.*, Mar., '97, 21 : 267); "The Austro-Hungarian Army" (*H. M.*, June, '92, 85 : 50); "Austria" (*J. S. G.*, Dec., '98, 2 : 394); "Wheeling in Tyrolean Valleys" (*Cent. Mag.*,

Apr., '97, 53:866); "Constantinople" (*S. M.*, Dec., '93–Jan., '94, Vols. 14 and 15); "A Visit to Athens" (*H. M.*, June, '96, 93:3); "In the Wake of a War" (Greece) (*H. M.*, Mar., '98, 96:548).

Asia. Lyde, "A Geography of Asia" (McM., $0.50); Carpenter, "Asia" (A. B. C., $0.60); Smith, "Life in Asia" (S. B. C., $0.60); "Across Asia on a Bicycle" (*Cent. Mag.*, May–Oct., '94, Vol. 48); Series of articles on Southwest Asia and India (*H. M.*, '90, '93–'95, Vols. 81, 87–91); Mathews, "New Testament Times in Palestine" (McM., $0.75); Douglas, "The Land where Jesus Christ lived" (Thomas Nelson & Sons, New York, $1.00); Curtis, "Howadji in Syria" (H. B., $1.50); "The Holy Places of Islam" (*H. M.*, Nov., '92, 85:813); "The Russo-Siberian Plain" (*J. S. G.*, March, '00, 4:81); "A Winter Journey through Siberia" (*Cent. Mag.*, Sept., '91, 42:643); Articles on Siberia (*H. M.*, July and Aug., '98, 97:240 and 327); Lyall, "The Rise of the British Dominion in India" (Scrib., $1.50); Pratt, "Stories of India" (E. P. C., $0.40); Kipling, "The Jungle Books" (Cent., $1.50); Elephant and Tiger Hunting in India (*H. M.*, July and Oct., '92, 85:290 and 706); "An American in Tibet" (*Cent. Mag.*, Nov., '90–March, '91, Vol. 41); "Among the Farthest People" (Tibet) (*Cos.*, Feb., 1900, 28:443); "Life in the Malay Peninsula" (*Cent. Mag.*, Feb., '93, 45:577); Colquhoun, "Overland to China" (H. B., $3.00); Colquhoun, "China in Transformation" (H. B., $3.00); "The Crisis in China" (H. B.; $1.00); Little, "Through the Yangtse Gorges" (Scrib., $2.50); Ralph, "Alone in China" (H. B., $2.00); Pratt, "Stories of China" (E. P. C., $0.40); "In the City of Canton" (*Cent. Mag.*, Nov., '94, 49:59); "The Great Wall of China" (*Cent. Mag.*, Jan., '93, 45:327 and 332); Series of Articles on China (*Cent. Mag.*, Aug.–Oct., '99, Vol. 58); also (*H. M.*, June–Aug., '95, Vol. 91); Griffis, "Corea: The Hermit Nation" (Scrib., $2.50); "Korea and the Koreans" (*N. G. M.*, '90, 2:231); Norman, "The Real Japan" (Scrib., $1.50); Scidmore, "Jinrikisha Days in Japan" (H. B., $2.00); Bramhall, "Wee Ones of Japan" (H. B., $1.00); Series of Articles on Japan (*H. M.*, '94 and '95, Vols. 89 and 90); also (*S. M.*, Apr.–June, '93, Vol. 13); also (*S. M.*, '90 and '91, Vols. 8 and 9); "Japanese Women" (*H. M.*, Dec., '90, 82:119); "An American Artist in Japan" (*Cent. Mag.*, Sept., '89, 38:670).

Africa. Lyde, "A Geography of Africa" (McM., $0.50); Stanley and others, "Africa: Its Partition and Its Future" (Dodd, Mead &

Co., New York, $1.25); Badlam, "Views in Africa" (S. B. C., $0.72); Annual Address of President Hubbard, "Africa, Its Past and Future" (*N. G. M.*, '89, 1: 99); "Africa since 1888" (*N. G. M.*, May, '96, 7 : 157); Curtis, "Nile Notes of a Howadji" (H. B., $1.50); Edwards, "A Thousand Miles up the Nile" (G. Routledge & Sons, New York, $2.50); Rawlinson, "The Story of Ancient Egypt" (Put., $1.50); "The Egyptian Sudan and Its History" (*J. S. G.*, Feb. '99, 3 : 41); "In Fascinating Cairo" (*Cent. Mag.*, Oct., '99, 58 : 811); "Climatic Control in the Desert" (*J. S. G.*, Sept., '99, 4 : 255); "A Sahara Caravan" (*S. M.*, March, '93, 13 : 315); "Cairo in 1890" (*H. M.*, Oct., Nov., '91, 83 : 651 and 828); "Peeps into Barbary" (*H. M.*, Aug., '96, 93 : 387); "Tripoli of Barbary" (*S. M.*, Jan., '90, 7 : 37); "An Arab Fête in the Desert" (*Cos.*, Apr., '97, 22 : 665); Bryce, "Impressions of South Africa" (Cent., $3.50); Stanley, "Through South Africa" (Scrib., $1.00); Hillegas, "Oom Paul's People" (App., $1.50); Bigelow, "White Man's Africa" (H. B., $2.50); Younghusband, "South Africa of To-day" (McM., $2.00); "Empire-building in South Africa" (*Cos.*, March, '96, 20 : 472); Drummond, "Tropical Africa" (Scrib., $1.00); Stanley, "My Kalulu" (Scrib., $1.50); Stanley, "My Dark Companions" (Scrib., $2.00); "The Pygmies of the Great African Forest" (*S. M.*, Jan., '91, 9 : 3); "Abyssinia" (*N. G. M.*, March, '01, 12 : 89); "The Gold Coast, Ashanti and Kumassi" (*N. G. M.*, Jan., '97, 8 : 1); "Life among the Congo Savages" (*S. M.*, Feb., '90, 7 : 135).

Australia, etc. Davitt, "Life and Progress in Australasia" (New Amsterdam Book Co., New York, $2.50); Pratt, "Stories of Australasia" (E. P. C., $0.40); Kellogg, "Australia and the Islands of the Sea" (S. B. C., $0.68); Ballou, "Under the Southern Cross" (H. M. C., $1.50); "The Australian Horseman" (*H. M.*, July, '99, 99 : 257); "Convicts and Bushrangers in Australia" (*Cos.*, May and June, '96, 21 : 91 and 173); "New Zealand" (*H. M.*, Aug., '91, 83 : 327); Chalmers, "Pioneer Life and Work in New Guinea" (F. H. Revell & Co., New York, $1.50); Reeves, "Brown Men and Women" (McM., $3.50); "A Little Journey in Java" (*H. M.*, May, '94, 88 : 918); "Down to Java" (*Cent. Mag.*, Aug., '97, 54 : 527); "The Climate of the Philippine Islands" (*J. S. G.*, Dec., '99, 3 : 361); "The Samoan Islands" (*N. G. M.*, Nov., 1900, 11 : 417); "Samoa" (*N. G. M.*, June, 1900, 10 : 207).

APPENDIX II

TABLES OF AREA, POPULATION, ETC.

SIZE OF THE EARTH

Length of the Earth's Diameter at the Equator (miles),	7,926	The Earth's Surface (square miles),	196,940,000
Length of Equator (miles),	24,902	Total area of oceans (square miles),	141,486,000

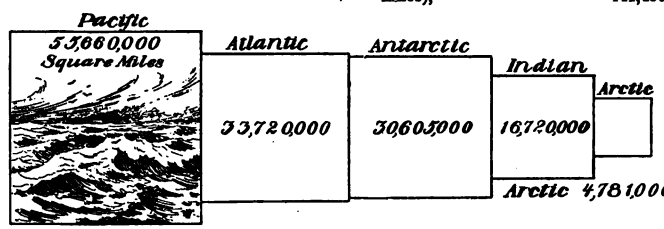


FIG. 436.

Relative areas of oceans. The Antarctic includes the great southern sea surrounding the south pole.

PRINCIPAL COUNTRIES, COLONIES, ETC.

	Area in Square Miles	Population
North America, '00	8,843,070	103,500,000
Alaska, '00	590,884	63,592
Bahama Islands, '01	5,450	53,735
Bermuda Islands, 01	20	17,535
British Honduras, '00	7,562	36,998
Canada, '01	3,653,946	5,369,666
Central America, '01	181,523	4,015,369
Costa Rica, '99	22,996	309,683
Cuba, '99	41,655	1,572,797
Greenland, '90	500,000	10,516
Guatemala, '00	48,290	1,574,340
Haiti (Island), '97	28,250	1,380,000
Honduras, '00	46,250	587,500
Jamaica, '98	4,200	745,104
Mexico, '00	767,005	13,545,462
Newfoundland, '99	42,200	210,000
Nicaragua, '00	49,200	500,000
St. Croix, '90	84	19,788
St. John, '90	21	984
St. Thomas, '90	32	12,019
Salvador, '01	7,225	1,006,848

United States. See page after next.

	Area in Square Miles	Population
South America, '00	**7,681,420**	**41,200,000**
Argentina, '00	1,113,849	4,794,149
Bolivia, '00	784,890	1,788,674
Brazil, '92	3,209,878	18,000,000
Chile, '00	279,901	3,128,095
Colombia, '81	504,738	3,878,600
Ecuador, '89	116,000	1,205,600
Falkland Isds., '01	6,500	2,043
Galapagos Isds., '89	2,400	400
Guiana, British, '01	109,000	288,170
Guiana, Dutch, '99	46,060	67,128
Guiana, French, '00	30,500	30,300
Juan Fernandez	36	
Paraguay, '99	157,000	630,108
Peru, '96	695,733	4,609,999
South Georgia Isds	1,000	uninhabited
Tobago, '01	114	18,750
Trinidad Isd., '01	1,754	258,250
Uruguay, '00	72,210	980,680
Venezuela, '94	593,943	2,444,816
Europe, '00	**3,855,828**	**376,400,000**
Andorra, '97	175	6,000
Austria, '00	115,903	26,150,597
Austria-Hungary, '00	264,204	46,810,981
Balearic Isles, '97	1,860	306,926
Belgium, '00	11,373	6,693,310
British Empire, '01	11,187,218	396,105,693
British Isles, '01	120,979	41,605,328
Bulgaria, '01	37,860	3,733,189
Corsica, '01	3,377	276,829
Crete, '01	3,326	309,258
Denmark, '01	15,360	2,464,770
England, '01	50,863	31,070,194
Faroe Isds., '01	512	15,230
France, '01	204,092	38,641,333
German Empire, '00	208,830	56,367,178
Great Britain, '01	88,094	36,998,178
Greece, '96	25,014	2,433,806
Hebrides Isds., '97	3,000	100,000
Hungary, '00	125,039	19,092,292
Iceland, '90	39,756	70,927
Ireland, '01	32,583	4,456,546
Italy, '01	110,646	32,449,754
Liechtenstein, '91	65	9,484
Luxemburg, '00	998	236,543
Malta, '00	95	188,679
Monaco, '90	8	13,304
Montenegro, '01	3,630	228,000
Netherlands, '00	12,648	5,179,100
Norway, '00	124,445	2,239,880
Orkney Isds., '01	376	28,698
Portugal, '00	36,088	5,428,659
Prussia, '00	134,608	34,472,509
Roumania, '99	50,720	5,912,520
Russia, '97	2,095,616	106,264,186
Russian Empire, '97	8,660,395	129,004,514
San Marino, '97	23	9,587
Sardinia, '01	9,294	789,314
Scotland, '01	29,785	4,472,103
Servia, '00	18,630	2,493,770
Shetland Isds., '01	551	28,185
Sicily, '01	9,936	3,529,266
Spain, '97	197,670	18,089,500
Sweden, '00	172,876	5,136,441
Switzerland, '01	15,976	3,315,443
Turkey, '00	65,752	6,086,800
Turkish Empire, '00	1,579,982	40,440,957
Wales, '01	7,446	1,455,881
Asia, with East Indies, '00	**16,770,951**	**877,000,000**
Aden, '01	80	41,222
Afghanistan, '01	215,400	4,000,000
Arabia, '01	845,000	6,000,000
Baluchistan, '01	134,000	810,000
Bhutan, '01	16,800	200,000
Bokhara, '01	92,000	2,500,000
Burma, '01	168,550	9,221,161
Ceylon, '01	25,333	3,576,990
China (proper), '01	1,358,350	383,000,000
Chinese Empire, '01	4,284,910	399,680,000
Chinese Turkestan, '01	481,800	580,000
Cyprus, '01	3,584	287,022
Formosa, '98	13,458	2,640,309
French India, '01	196	275,100
French Indo-China, '01	256,096	17,999,850
India, '01	1,559,603	294,266,701
Japan, '98	161,198	46,458,249
Khiva, '01	22,320	800,000
Korea, '01	82,000	8–16,000,000
Manchuria, '01	362,310	7,500,000
Mongolia, '01	1,288,000	2,000,000
Nepal, '01	54,000	2–5,000,000
Oman, '01	82,000	1,500,000
Palestine, '01	10,000	400,000
Persia, '01	628,000	9–9,500,000
Portuguese Indies, '01	7,458	800,000
Russia in Asia, '97	6,564,778	22,697,469
Russian Turkestan, '97	409,484	4,888,188
Siam, '01	244,000	5,000,000
Siberia, '97	4,888,496	5,727,090
Straits Settlements, '01	1,472	572,249
Sungaria, '01	147,950	600,000
Tibet, '01	651,500	6,000,000
Turkey in Asia, '01	650,394	17,545,800

	Area in Square Miles	Population
Africa, '00	**11,508,793**	**170,000,000**
Abyssinia, '01	150,000	3,500,000
Algeria (Fr.), '01	184,474	4,774,042
Ashanti (Br.), '91	15,000	1,473,882
British Central and South Africa, '00	680,945	3,000,000
British East Africa, '00	1,000,000	6,620,000
British Somaliland, '91	68,000	240,000
Canary Isds. (Sp.), '97	2,808	334,521
Cape Colony (Br.), '01	276,775	2,350,000
Cape Verde Isds. (Port.) '00	1,480	147,424
Egypt, '97	400,000	9,734,405
Egyptian Sudan, '01	950,000	10,000,000
Eritrea (Italy), '01	88,500	450,000
French Sudan, '01	354,000	2,360,000
French Kongo, '01	496,920	8,950,000
French Somaliland, '01	8,640	30,000
French Territory, '01	3,684,144	38,123,880
Gambia (Br.), '97,	2,700	50,000
German East Afr., '01	384,180	8,000,000
German Southwest Africa, '01	322,450	202,628
German Territory, '01	931,460	14,200,000
Gold Coast (Br.), '01	40,000	1,473,882
Italian Somaliland, '98	100,000	400,000
Kamerun (Ger.), '01	191,130	3,500,000
Kongo State, '01	900,000	30,000,000
Liberia, '01	14,360	1,068,000
Madagascar (Fr.), '00.	227,750	2,244,872
Madeira Islands, '00	505	150,528
Mauritius (Br.), '01	705	370,407
Morocco, '01	219,000	5,000,000
Natal (Br.), '00	29,200	929,970
Niger Territories (Br.), '01	4–500,000	25–40,000,000
Orange River Col., '90	48,326	207,508
Portuguese E. Afr., '01	801,000	3,120,000
Portuguese Guinea, '01	4,440	820,000
Portuguese West Africa, '01	484,800	4,119,000
Reunion Island (Fr.), '01	970	173,200
St. Helena (Br.), '01	47	5,195
Sierra Leone (Br.), '01	4,000	74,885
Spanish Africa, '97	252,850	180,000
Togo, '01	33,700	2,500,000
Transvaal Colony, '98	119,140	1,094,100
Tripoli (Turk.), '01	398,788	1,800,000
Tunis (Fr.), '01	51,000	1,900,000
Zanzibar (Br.), '01	640	150,000
Australia, '01	**2,972,573**	**3,767,443**
New South Wales, '01	310,367	1,352,297
Northern Territory, '01	—	4,890
Queensland, '01	668,497	496,596
South Australia, '01	903,690	362,604
Tasmania, '01	26,215	172,475
Victoria, '01	87,884	1,200,918
Western Australia, '01	975,920	182,558
East Indies and Larger Islands of Pacific.		
Borneo, '91	309,343	2,025,578
Celebes, '01	71,470	1,997,860
Fiji Islands, '97	8,045	117,870
Hawaiian Islands, '00	6,449	154,001
Java, '01	50,554	26,125,058
Molucca Islands, '01	43,864	399,208
New Caledonia, '01	7,700	53,000
New Guinea, '01	275,329	3,050,000
New Zealand, '01	104,471	772,719
Philippine Islands, '00	114,356	8,000,000
Samoa Islands, '01	1,079	36,300
Solomon Islands, '01	16,300	175,000
Sumatra, '01	161,612	3,209,037

STATES AND TERRITORIES OF THE UNITED STATES

	Area in Square Miles	Population, 1900
Alabama	52,250	1,828,697
Alaska	590,884	63,592
Arizona	113,020	122,931
Arkansas	53,850	1,311,564
California	158,360	1,485,053
Colorado	103,925	539,700
Connecticut,	4,990	908,355
Delaware	2,050	184,735
District of Columbia	70	278,718
Florida	58,680	528,542
Georgia	59,475	2,216,331
Guam, '97	180	8,561
Hawaiian Islands	6,449	154,001
Idaho	84,800	161,772
Illinois	56,650	4,821,550
Indiana	36,350	2,516,462
Indian Territory	31,400	391,960
Iowa	56,025	2,231,853
Kansas	82,080	1,470,495
Kentucky	40,400	2,147,174

	Area in Square Miles	Population, 1900
Louisiana	48,720	1,381,625
Maine	33,040	694,466
Maryland	12,210	1,190,050
Massachusetts	8,315	2,805,346
Michigan	58,915	2,420,982
Minnesota	83,365	1,751,394
Mississippi	46,810	1,551,270
Missouri	69,415	3,106,665
Montana	146,080	243,329
Nebraska	77,510	1,068,589
Nevada	110,700	42,335
New Hampshire	9,305	411,588
New Jersey	7,815	1,883,669
New Mexico	122,580	195,310
New York	49,170	7,268,012
North Carolina	52,250	1,893,810
North Dakota	70,795	319,146
Ohio	41,060	4,157,545
Oklahoma	39,030	398,245
Oregon	96,030	413,536
Pennsylvania	45,215	6,302,115
Philippine Islands, '00	114,356	8,000,000
Porto Rico, '99	3,550	953,243
Rhode Island	1,250	428,556
South Carolina	30,570	1,340,316
South Dakota	77,650	401,570
Tennessee	42,050	2,020,616
Texas	265,780	3,048,710
Tutuila	55	3,750
Utah	84,970	276,749
Vermont	9,565	343,641
Virginia	42,450	1,854,184
Washington	69,180	518,103
West Virginia	24,780	958,800
Wisconsin	56,040	2,069,042
Wyoming	97,890	92,531
United States, total	**3,741,074**	**85,268,941**
United States (without Alaska, Philippine Isds., etc.)	**3,025,000**	**76,085,794**

TWENTY-FIVE LARGEST CITIES IN THE WORLD

	Population
1. London, England, '01	4,536,063
Greater London, '01	6,580,616
2. New York, U.S., '00	3,437,202
3. Paris, France, '01	2,660,559
4. Canton, China, '97	2,500,000
5. Berlin, Germany, '00	1,888,826
6. Chicago, U.S., '00	1,698,575
7. Vienna, Austria-Hungary, '00	1,674,957
8. Tokio, Japan, '98	1,440,121
9. Philadelphia, U.S., '00	1,293,697
10. St. Petersburg, Russia, '97	1,267,023
11. Constantinople, Turkey, '01	1,136,000
12. Calcutta, India, '01	1,121,664
13. Moscow, Russia, '97	988,614
14. Tienstin, China, '97	950,000
15. Peking, China, '98	900,000
16. Buenos Aires, Argentina, '00	821,291
17. Hankau, China, '97	800,000
18. Bombay, India, '01	770,843
19. Glasgow, Scotland, '01	735,906
20. Hamburg, Germany, '00	705,738
21. Hangchau, China, '97	700,000
22. Liverpool, England, '01	684,947
23. Fuchau, China, '97	650,000
24. Warsaw, Russia, '97	638,209
25. St. Louis, U.S., '00	575,238

TWENTY-FIVE LARGEST CITIES IN THE UNITED STATES IN 1900

	Population
1. New York, N.Y.	3,437,202
2. Chicago, Ill.	1,698,575
3. Philadelphia, Pa.	1,293,697
4. St. Louis, Mo.	575,238
5. Boston, Mass	560,892
6. Baltimore, Md	508,957
7. Cleveland, Ohio	381,768
8. Buffalo, N.Y.	352,387
9. San Francisco, Cal.	342,782
10. Cincinnati, Ohio	325,902
11. Pittsburg, Pa.	321,616
12. New Orleans, La	287,104
13. Detroit, Mich	285,704
14. Milwaukee, Wis.	285,315
15. Washington, D.C.	278,718
16. Newark, N.J.	246,070
17. Jersey City, N.J.	206,433
18. Louisville, Ky.	204,731
19. Minneapolis, Minn.	202,718
20. Providence, R.I.	175,597
21. Indianapolis, Ind.	169,164
22. Kansas City, Mo.	163,752
23. St. Paul, Minn.	163,065
24. Rochester, N.Y.	162,608
25. Denver, Colo.	133,859

CITIES OF THE UNITED STATES WITH 25,000 OR MORE INHABITANTS IN 1900; AND A FEW OTHERS, MOSTLY MENTIONED IN THE BOOK

(Cuban cities listed here)

	Population
Akron, Ohio	42,728
Albany, N.Y.	94,151
Albuquerque, N.M.	6,238
Allegheny, Pa.	129,896
Allentown, Pa.	35,416
Altoona, Pa.	38,973
Annapolis, Md.	8,402
Ashland, Wis.	18,074
Atchison, Kan.	15,722
Atlanta Ga.	89,872
Atlantic City, N.J.	27,838
Auburn, N.Y.	30,345
Augusta, Ga.	39,441
Augusta, Me.	11,683
Austin, Tex.	22,258
Baltimore, Md.	508,957
Bangor, Me.	21,850
Bath, Me.	10,477
Baton Rouge, La.	11,269
Bay City, Mich.	27,628
Bayonne, N.J.	32,722
Binghamton, N.Y.	39,647
Birmingham, Ala.	38,415
Bismarck, N.D.	3,319
Boise, Idaho	5,957
Boston, Mass.	560,892
Bridgeport, Conn.	70,996
Brockton, Mass.	40,063
Buffalo, N.Y.	352,387
Burlington, Vt.	18,640
Butte, Mont.	30,470
Cambridge, Mass.	91,886
Camden, N.J.	75,935
Canton, Ohio	30,667
Carson City, Nev.	2,100
Cedar Rapids, Iowa	25,656
Charleston, S.C.	55,807
Charleston, W.Va.	11,099
Charlotte, N.C.	18,091
Chattanooga, Tenn.	32,490
Chelsea, Mass.	34,072
Chester, Pa.	33,988
Cheyenne, Wyo.	14,087
Chicago, Ill.	1,698,575
Cincinnati, Ohio	325,902
Cleveland, Ohio	381,768
Colorado Springs, Colo.	21,085
Columbia, S.C.	21,108
Columbus, Ga.	17,614
Columbus, Ohio	125,560
Concord, N.H.	19,632
Council Bluffs, Iowa	25,802
Covington, Ky.	42,988
Cripple Creek, Colo.	10,147
Dallas, Tex.	42,638
Danville, Va.	16,520
Davenport, Iowa	35,254
Dayton, Ohio	85,333
Denver, Colo.	133,859
Des Moines, Iowa	62,139
Detroit, Mich.	285,704
Dover, Del.	3,329
Dubuque, Iowa	36,297
Duluth, Minn.	52,969
Durham, N.C.	6,679
Easton, Pa.	25,238
East St. Louis, Ill.	29,655
Elizabeth, N.J.	52,130
Elmira, N.Y.	35,672
El Paso, Tex.	15,906
Erie, Pa.	52,733
Evansville, Ind.	59,007
Fall River, Mass.	104,863
Fitchburg, Mass.	31,531
Fort Wayne, Ind.	45,115
Fort Worth, Tex.	26,688
Frankfort, Ky.	9,487
Galveston, Tex.	37,789
Gloucester, Mass.	26,121
Grand Rapids, Mich.	87,565
Greenville, S.C.	11,860
Guthrie, Ok.	10,006
Harrisburg, Pa.	50,167
Hartford, Conn.	79,850
Havana, Cuba, '99	235,981
Haverhill, Mass.	37,175
Helena, Mont.	10,770
Hoboken, N.J.	59,364
Holyoke, Mass.	45,712
Honolulu, Hawaiian Islands	39,306
Houston, Tex.	44,633
Indianapolis, Ind.	169,164
Jackson, Mich.	25,180
Jackson, Miss.	7,816
Jacksonville, Fla.	28,429
Jefferson City, Mo.	9,664
Jersey City, N.J.	206,433
Johnstown, Pa.	35,936
Joliet, Ill.	29,353
Joplin, Mo.	26,023

	Population
Juneau, Alaska	1,864
Kansas City, Kan.	51,418
Kansas City, Mo.	163,752
Key West, Fla.	17,114
Knoxville, Tenn.	32,637
La Crosse, Wis.	28,895
Lancaster, Pa.	41,459
Lansing, Mich.	16,485
Lawrence, Mass.	62,559
Leadville, Colo.	12,455
Lewiston, Me.	28,761
Lexington, Ky.	26,369
Lincoln, Neb.	40,169
Little Rock, Ark.	38,307
Los Angeles, Cal.	102,479
Louisville, Ky.	204,731
Lowell, Mass.	94,969
Lynchburg, Va.	18,891
Lynn, Mass.	68,513
Madison, Wis.	19,164
Malden, Mass.	33,664
Manchester, N.H.	56,987
Manila, Philippines, '01	350,000
Marquette, Mich.	10,058
Matanzas, Cuba, '99	45,282
McKeesport, Pa.	34,227
Memphis, Tenn.	102,320
Milwaukee, Wis.	285,315
Minneapolis, Minn.	202,718
Mobile, Ala.	38,469
Montgomery, Ala.	30,346
Montpelier, Vt.	6,266
Nashville, Tenn.	80,865
Newark, N.J.	246,070
New Bedford, Mass.	62,442
New Britain, Conn.	25,998
Newcastle, Pa.	28,389
New Haven, Conn.	108,027
New Orleans, La.	287,104
Newport, Ky.	28,301
Newton, Mass.	33,587
New York, N.Y.	3,437,202
Norfolk, Va.	46,624
Oakland, Cal.	66,960
Ogden, Utah	16,313
Oklahoma, Ok.	10,037
Olympia, Wash.	4,082
Omaha, Neb.	102,555
Oshkosh, Wis.	28,284
Passaic, N.J.	27,777
Paterson, N.J.	105,171
Pawtucket, R.I.	39,231
Peoria, Ill.	56,100
Philadelphia, Pa.	1,293,697
Phœnix, Ariz.	5,544

	Population
Pierre, S.D.	2,306
Pittsburg, Pa.	321,616
Plymouth, Mass.	9,562
Portland, Me.	50,145
Portland, Ore.	90,426
Ponce, Porto Rico, '99	27,952
Providence, R.I.	175,597
Pueblo, Colo.	28,157
Quincy, Ill.	36,252
Racine, Wis.	29,102
Raleigh, N.C.	13,643
Reading, Pa.	78,961
Richmond, Va.	85,050
Roanoke, Va.	21,445
Rochester, N.Y.	162,608
Rockford, Ill.	31,051
Rutland, Vt.	11,499
Sacramento, Cal.	29,282
Saginaw, Mich.	42,345
St. Joseph, Mo.	102,979
St. Louis, Mo.	575,238
St. Paul, Minn.	163,065
Salem, Mass.	35,956
Salem, Ore.	4,258
Salt Lake City, Utah	53,531
San Antonio, Tex.	53,321
San Francisco, Cal.	342,782
San Juan, Porto Rico, '99	32,048
Santa Fé, N.M.	5,603
Santiago, Cuba, '99	45,478
Savannah, Ga.	54,244
Schenectady, N.Y.	31,682
Scranton, Pa.	102,026
Seattle, Wash.	80,671
Sioux City, Iowa	33,111
Sioux Falls, S.D.	10,266
Sitka, Alaska	1,396
Somerville, Mass.	61,643
South Bend, Ind.	35,999
South Omaha, Neb.	26,001
Spokane, Wash.	36,848
Springfield, Ill.	34,159
Springfield, Mass.	62,059
Springfield, Ohio	38,253
Superior, Wis.	31,091
Syracuse, N.Y.	108,374
Tacoma, Wash.	37,714
Tallahassee, Fla.	2,981
Taunton, Mass.	31,036
Terre Haute, Ind.	36,673
Toledo, Ohio	131,822
Topeka, Kan.	33,608
Trenton, N.J.	73,307
Troy, N.Y.	60,651
Tucson, Ariz.	7,531

	Population
Utica, N.Y.	56,383
Virginia City, Nev.	2,695
Washington, D.C.	278,718
Waterbury, Conn.	45,859
Wheeling, W. Va.	38,878
Wichita, Kan.	24,671
Wilkes Barre, Pa.	51,721
Williamsport, Pa.	28,757
Wilmington, Del.	76,508
Woonsocket, R.I.	28,204
Worcester, Mass.	118,421
Yonkers, N.Y.	47,931
York, Pa.	33,705
Youngstown, Ohio	44,885

FOREIGN CITIES MENTIONED IN THE TEXT

	Population
Aachen, Germany, '00	735,235
Abbeokuta, Niger Terr., '97	150,000
Aberdeen, Scotland, '01	143,722
Adelaide, Australia, '01	160,691
Aden, Aden, '91	41,910
Adiz Abeba, Abyssinia, '01	10,000
Alexandria, Egypt, '97	319,766
Algiers, Algeria, '99	96,784
Amsterdam, Netherlands, '00	520,602
Antwerp, Belgium, '00	285,600
Archangel, Russia, '97	17,802
Arequipa, Peru, '01	35,000
Asuncion, Paraguay, '95	45,000
Athens, Greece, '96	111,486
Auckland, New Zealand, '01	34,213
Bagdad, Turkey in Asia, '00	145,000
Bahia, Brazil, '90	174,412
Baku, Russia, '97	112,253
Ballarat, Australia, '99	46,410
Bangkok, Siam, '96	250,000
Barcelona, Spain, '97	509,589
Barmen, Germany, '00	141,947
Basel, Switzerland, '01	111,009
Batavia, Java, '97	115,567
Belfast, Ireland, '01	348,876
Belgrade, Servia, '00	69,097
Benares, India, '01	203,095
Bendigo, Australia, '97	43,112
Berbera, Br. Somaliland, '97	30,000
Bergen, Norway, '01	72,251
Berlin, Germany, '00	1,888,326
Berne, Switzerland, '01	64,864
Bethany, Holy Land, '90	1,105
Bethlehem, Holy Land, '97	5,000
Bilbao, Spain, '97	74,093
Birmingham, England, '01	522,182
Bloemfontein, South Africa, '90	3,379
Bogota, Colombia, '86	120,000
Bologna, Italy, '01	152,009
Bombay, India, '01	770,843
Bordeaux, France, '01	257,471
Bradford, England, '01	279,809
Bremen, Germany, '00	163,418
Breslau, Germany, '00	422,738
Brindisi, Italy, '97	14,000
Brisbane, Australia, '01	119,428
Bristol, England, '01	328,842
Brussels, Belgium, '00	561,782
Bucharest, Roumania, '00	282,071
Budapest, Austria-Hungary, '00	732,322
Buenos Aires, Argentina, '00	821,291
Cadiz, Spain, '97	70,177
Cairo, Egypt, '97	570,062
Calcutta, India, '01	1,121,664
Callao, Peru, '01	16,000
Cambridge, England, '91	36,983
Canton, China, '97	2,500,000
Cape Town, Cape Colony, '91	51,251
Caracas, Venezuela, '94	72,429
Cardiff, Wales, '01	164,420
Cartagena, Colombia, '86	20,000
Cartagena, Spain, '97	86,245
Catania, Italy, '01	149,694
Cayenne, French Guiana, '97	12,351
Cettinge, Montenegro, '97	2,920
Chemnitz, Germany, '00	206,584
Chengtu, China, '96	250,000
Christchurch, New Zealand, '01	17,588
Christiania, Norway, '98	200,000
Ciudad Bolivar, Venezuela, '91	11,686
Cologne, Germany, '00	372,229
Colon, Colombia, '97	3,000
Constantinople, Turkey, '01	1,125,000
Copenhagen, Denmark, '01	378,235
Cordoba, Argentina, '01	50,000
Cordoba, Spain, '97	57,313
Cork, Ireland, '01	99,693
Cuzco, Peru, '96	20,000
Damascus, Turkey in Asia, '00	140,500
Danzig, Germany, '00	140,589

	Population
Dawson, Canada, '01	9,142
Delhi, India, '01	208,385
Dover, England, '91	33,418
Dresden, Germany, '00	395,349
Dublin, Ireland, '01	286,328
Dundee, Scotland, '01	160,871
Dunedin, New Zealand, '01	24,879
Durban, Natal, '00	48,410
Edinburgh, Scotland, '01	316,479
Elberfeld, Germany, '09	156,987
Essen, Germany, '00	118,863
Fachau, China, '98	400,000
Flume, Austria-Hungary, '00	38,955
Fez, Morocco, '89	140,000
Florence, Italy, '01	204,950
Frankfort, Germany, '00	288,489
Fredericton, Canada, '01	7,117
Freetown, Sierra Leone, '91	30,033
Fuchau, China, '97	650,000
Geneva, Switzerland, '01	105,139
Genoa, Italy, '01	234,800
Georgetown, British Guiana, '01	53,176
Ghent, Belgium, '00	160,949
Gibraltar, Spanish Pen., '00	27,460
Glasgow, Scotland, '01	735,906
Gothenburg, Sweden, '00	130,619
Grenada, Spain, '97	75,054
Grimsby, England, '01	63,138
Guatemala, Guatemala, '98	72,102
Guayaquil, Ecuador, '98	50,000
Hague, The, Netherlands, '00	212,211
Halifax, Canada, '00	40,787
Halle, Germany, '00	156,611
Hamburg, Germany, '00	705,738
Hamilton, Canada, '01	52,550
Hammerfest, Norway, '91	2,239
Hangchau, China, '97	700,000
Hankau, China, '97	800,000
Hanover, Germany, '00	235,666
Havre, France, '01	129,014
Hebron, Holy Land, '97	10,000
Helsingfors, Russia, '96	77,484
Hobart, Tasmania, '01	24,654
Hongkong, China, '01	297,212
Hue, French Ind. China, '97	30,000
Hull, England, '01	240,618
Hyderabad, India, '01	446,291
Iquique, Chile, '00	42,440
Irkutsk, Siberia, '96	51,434
Jerusalem, Holy Land, '01	42,000
Johannesburg, Transvaal, '96	102,078
Joppa, Holy Land, '97	23,000
Kabul, Afghanistan, '97	70,000
Khartum, Egyptian Sudan, '98	25,000
Khelat, Baluchistan, '97	14,000

	Population
Kiev, Russia, '97	247,482
Kimberley, Cape Colony, '91	28,718
Kingston, Jamaica, '91	46,542
Kioto, Japan, '98	353,139
Krefeld, Germany, '00	106,928
Kumassi, Ashanti, '97	18,000
La Guaira, Venezuela, '97	8,000
La Paz, Bolivia, '00	57,000
La Plata, Argentina, '01	61,000
Lassa, Tibet, '97	25,000
Leeds, England, '98	428,953
Leghorn, Italy, '00	98,505
Leicester, England, '01	211,574
Leipzig, Germany, '00	455,089
Leith, Scotland, '01	76,667
Libreville, French Kongo, '97	3,000
Liege, Belgium, '00	173,708
Lille, France, '01	215,431
Lima, Peru, '91	108,956
Limoges, France, '01	83,569
Lisbon, Portugal, '00	357,000
Liverpool, England, '01	684,947
Loanda, Port. W. Africa, '97	14,000
Lodz, Russia, '97	315,209
London, Canada, '01	37,983
London, England, '01	4,536,063
London, Greater, '01	6,580,616
Lourenço Marquez, Port. E. Af., '00	6,630
Lucerne, Switzerland, '01	29,683
Lucknow, India, '01	263,951
Lyon, France, '96	458,145
Madras, India, '01	509,397
Madrid, Spain, '97	512,150
Magdeburg, Germany, '00	229,663
Malaga, Spain, '97	125,579
Manãos, Brazil, '93	20,000
Manchester, England, '97	543,969
Mandalay, Burma, '01	182,498
Marseille, France, '01	494,769
Maskat, Oman, '97	40,000
Mecca, Turkey, '01	60,000
Melbourne, Australia, '01	493,956
Messina, Italy, '01	149,823
Metz, Germany, '00	58,462
Mexico City, Mexico, '95	344,377
Milan, Italy, '01	491,460
Mocha, Turkey in Asia, '97	5,000
Mombasa, Br. E. Africa, '01	27,000
Monrovia, Liberia, '97	5,000
Montevideo, Uruguay, '97	249,251
Montreal, Canada, '01	266,826
Morocco, Morocco, '97	50,000
Moscow, Russia, '97	988,614
Munich, Germany, '00	499,959
Nagoya, Japan, '98	244,145

	Population
Naples, Italy, '01	563,781
Nazareth, Holy Land, '97	7,500
Newcastle, England, '01	214,803
Nice, France, '01	125,099
Nijni Novgorod, Russia, '97	95,124
Nottingham, England, '99	239,753
Nuremberg, Germany, '00	261,022
Odessa, Russia, '97	405,041
Oporto, Portugal, '00	172,421
Osaka, Japan, '98	821,235
Ottawa, Canada, '01	59,902
Oxford, England, '01	49,413
Palermo, Italy, '01	310,352
Panama, Colombia, '86	30,000
Para, Brazil, '92	65,000
Paramaribo, Dutch Guiana, '99	31,427
Paris, France, '01	2,660,559
Peking, China, '98	900,000
Pernambuco, Brazil, '90	111,556
Perth, West Australia, '97	36,199
Pietermaritzburg, Natal, '01	28,500
Piraeus, Greece, '96	42,169
Pisa, Italy, '01	61,279
Port Arthur, Russia in Asia	
Port au Prince, Haiti, '97	60,000
Port Said, Egypt, '97	42,095
Portsmouth, England, '01	189,160
Posen, Germany, '00	117,014
Potsdam, Germany, '00	59,814
Prague, Austria-Hungary, '00	201,589
Pretoria, Transvaal, '96	10,000
Pueblo, Mexico, '95	91,917
Quebec, Canada, '01	68,834
Queenstown, Ireland, '91	9,082
Quito, Ecuador, '97	80,000
Rangoon, Burma, '01	232,326
Reims, France, '01	107,773
Riga, Russia, '97	282,943
Rio de Janeiro, Brazil, '90	522,651
Rome, Italy, '01	463,000
Rosario, Argentina, '01	112,461
Rotterdam, Netherlands, '01	382,185
Roubaix, France, '01	124,660
Rouen, France, '01	115,914
St. Etienne, France, '01	146,671
St. John, Canada, '01	40,711
St. John's, Newfoundland, '99	29,007
St. Petersburg, Russia, '97	1,267,023
Samarkand, Russian Turkestan, '97	54,900
San Luis Potosi, Mexico, '95	69,676
San Salvador, Salvador, '01	59,540
Santiago, Chile, '00	291,725
Santos, Brazil, '97	15,000
São Paulo, Brazil, '92	100,000
Seoul, Korea, '01	193,082

	Population
Seville, Spain, '97	146,205
Sèvres, France, '91	6,902
Shanghai, China, '00	620,000
Sheffield, England, '01	380,717
Siangtan, China, '98	1,000,000
Singanfu, China, '98	600,000
Singapore, Straits Settlements, '01	228,555
Smyrna, Turkey, '85	200,000
Sofia, Bulgaria, '00	67,920
Southampton, England, '01	104,911
Stettin, Germany, '00	210,680
Stockholm, Sweden, '00	300,624
Strassburg, Germany, '00	150,268
Stuttgart, Germany, '00	176,818
Suchau, China, '00	500,000
Sucre, Bolivia, '00	20,900
Suez, Egypt, '82	10,919
Swansea, Wales, '01	94,514
Sydney, Australia, '00	451,000
Tananarivo, Madagascar, '97	90,000
Tangier, Morocco, '89	30,000
Tashkend, Russian Turkestan, '97	156,414
Teheran, Persia, '97	210,000
Tiberias, Holy Land, '97	3,000
Tientsin, China, '97	950,000
Tiflis, Russia, '97	160,645
Timbukto, Sudan, '97	20,000
Tokio, Japan, '98	1,440,121
Toronto, Canada, '01	207,971
Trebizond, Turkey in Asia, '97	35,000
Trieste, Austria-Hungary, '00	134,143
Tripoli, Tripoli, '85	30,000
Trondhjem, Norway, '00	38,180
Tunis, Tunis, '00	170,000
Turin, Italy, '01	335,689
Upernivik, Greenland, '70	700
Valencia, Spain, '97	204,768
Valparaiso, Chile, '00	185,674
Vancouver, Canada, '91	26,196
Venice, Italy, '01	151,841
Vera Cruz, Mexico, '95	38,998
Versailles, France, '01	54,081
Victoria, Canada, '01	20,821
Vienna, Austria-Hungary, '00	1,674,957
Vladivostok, Siberia, '96	43,843
Warsaw, Russia, '97	638,209
Wellington, New Zealand, '01	43,638
West Ham, England, '01	267,308
Winnipeg, Canada, '01	42,336
Wuchang, China, '98	800,000
Yarmouth, Canada, '01	6,480
Yokoba, Niger Terr., '97	50,000
Yokohama, Japan, '98	193,762
Zanzibar (British), '97	30,000
Zurich, Switzerland, '01	152,942

ELEVATION OF SOME PLATEAUS AND MOUNTAIN PEAKS

	Feet
Abyssinian Plateau	5–7,000
Aconcagua, Andes, Argentina (*highest in South America*)	22,860
Ararat, Turkey in Asia	17,325
Mt. Blanc, Alps, France (*highest in Alps*)	15,781
Bolivian Plateau	10–13,000
Brazilian Plateau	2–2,500
Chimborazo, Andes, Ecuador	20,498
Cotopaxi, Andes, Ecuador	19,618
Elbruz, Caucasus, Russia	18,200
Etna, Sicily	10,885
Everest, Himalayas, Nepal (*highest known in world*)	29,002
Frémont Peak, Rocky Mts., Wy.	13,790
Fujiyama, Japan	12,365
Hecla, Iceland	5,110
Kenia, Africa	18,630
Kilimanjaro, Africa (*highest known in Africa*)	19,780
Kosciusko, Australia (*highest in Australia*)	7,336
Logan, Coast Ranges, Canada (*highest known in Canada*)	19,539
McKinley, Alaska (*highest known in North America*)	20,464
Mauna Kea, Hawaiian Islands	13,805
Mauna Loa, Hawaiian Islands	13,675
Mexican Plateau	5–6,000
Mitchell, Appalachian Mts., N.C., (*highest in East'n U.S.*)	6,711
Orizaba, Mexico (*highest in Mexico*)	18,314
Pikes Peak, Rocky Mts., Colorado,	14,108
Popocatapetl, Mexico	17,798
Rainier, Cascade Mts., Washington,	14,526
St. Elias, Alaska	18,024
Shasta, Cascade Mts., California	14,380
Tibet Plateau	10–15,000
United States, Western Plateau	5–6,000
Vesuvius, Italy	4,200
Washington, White Mts, N.H. (*highest in Northeastern U.S.*)	6,293
Whitney, Sierra Nevada, California (*highest in Western U.S.*)	14,898

SOME OF THE LARGEST RIVERS OF THE WORLD

	Length in Miles	Basin Area Sq. Miles	Ocean
North America			
Colorado	2,000	225,049	Pacific
Columbia	1,400	216,587	Pacific
Mackenzie	2,000	590,000	Arctic
Missouri	3,000	527,155	Atlantic
Missouri-Mississippi	4,300	1,257,000	Atlantic
Nelson	1,732	482,000	Atlantic
Rio Grande	1,800	240,000	Atlantic
St. Lawrence	2,200	580,000	Atlantic
Yukon	2,000	440,000	Pacific
South America			
Amazon	3,300	2,500,000	Atlantic
Orinoco	1,350	366,000	Atlantic
Plata	2,580	1,200,000	Atlantic
São Francisco	1,800	200,000	Atlantic
Europe			
Danube	1,770	300,000	Atlantic
Dnieper	1,200	242,000	Atlantic
Dwina	1,000	140,000	Arctic
Elbe	725	55,000	Atlantic
Po	400	27,000	Atlantic
Rhine	800	75,000	Atlantic
Rhone	500	38,000	Atlantic

	Length in Miles	Basin Area Sq. Miles	Ocean
Europe			
Seine	482	30,300	Atlantic
Thames	228	6,100	Atlantic
Volga	2,400	563,300	Caspian
Asia			
Amur	2,800	520,000	Pacific
Brahmaputra	1,800	425,000	Indian
Ganges	1,500	440,000	Indian
Hoang-ho	2,700	570,000	Pacific
Indus	1,800	372,700	Indian
Irawadi	1,500	158,000	Indian
Lena	2,800	950,000	Arctic
Mekong	2,800	280,000	Pacific
Ob	3,200	1,050,000	Arctic
Yangtse-kiang	3,200	548,000	Pacific
Yenisei	3,000	1,500,000	Arctic
Africa			
Kongo	2,900	1,200,000	Atlantic
Niger	2,600	563,300	Atlantic
Nile	3,400	1,273,000	Atlantic
Zambesi	1,500	600,000	Indian
Australia			
Darling	1,100	—	Indian
Murray	1,000	270,000	Indian

SOME OF THE LARGE LAKES OF THE WORLD

	Area in Square Miles	Elevation in Feet	Greatest Depth in Feet
Aral Sea	26,900	160	225
Baikal	12,500	1,312	4,550
Balkash	7,800	780	70
Caspian	169,000	−85[1]	2,400
Chad, variable with season	10,000 and often more	800–900	12
Dead Sea	370	−1,310[1]	1,380
Erie	9,990	573	210
Great Bear Lake	11,200	200	—
Great Salt Lake	2,360	4,218	30–50
Great Slave Lake	10,100	—	over 650
Huron	22,322	582	750
Ladoga	7,000	60	730
Michigan	21,729	582	870
Nicaragua	8,600	110	88
Nyassa	14,000	1,500	600+
Ontario	7,104	247	738
Superior	30,829	602	1,008
Tanganyika	12,650	2,800	2,100
Titicaca	3,800	12,875	700
Victoria Nyanza	30,000	4,000	500+
Winnipeg	9,400	710	70

[1] *Below* sea level

DISTRIBUTION OF MANKIND

Mongolians	**540,000,000**
China	380,000,000
Japan and Korea	55,000,000
Indo-China	35,000,000
Malaysia	30,000,000
Other Mongolians	40,000,000
Caucasians	**770,000,000**
Europe	355,000,000
Asia	280,000,000
America	115,000,000
Africa	15,000,000
Australasia	5,000,000
Ethiopians	**175,000,000**
Africa and Madagascar	158,000,000
North and South America	20,000,000
American Indians	**22,170,000**
Mexico	8,765,000
Brazil	4,200,000
Colombia	3,150,000
Peru	2,700,000
Bolivia, Guatemala, and Venezuela	4,225,000
United States	250,000
Canada	100,000

RELIGIONS OF MANKIND

Buddhists and Brahmins	650,000,000
Christians	440,000,000
Jews	8,000,000
Mohammedans	180,000,000
Pagans and others	250,000,000

INDEX AND PRONOUNCING VOCABULARY

KEY TO PRONUNCIATION

a, as in *fat*; *ā*, as in *fate*; *ă*, as in *far*; *â*, as in *fall*; *e*, as in *pen*; *ē*, as in *mete*; *ė*, as in *her*; *i*, as in *pin*; *ī*, as in *pine*; *o*, as in *not*; *ō*, as in *note*; *ö*, as in *move*; *u*, as in *tub*; *ū*, as in *mute*; *u̇*, as in *pull*; *g*, as in *get*; *ġ*, as in *gem*; *c*, as in *cat*; *ç*, as in *cent*.

A double dot under a, e, or o (ạ, ẹ, ọ) indicates that its sound is shortened to that of *u* in *but*.

Italicized letters are silent. The sign ′ tells upon which syllable the accent is placed. The numbers refer to pages in the book excepting where Fig. is before them, when they refer to figures in the book.

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THE NEW ENGLAND STATES

The MMC Co.

TARR AND McMURRY GEOGRAPHIES

SUPPLEMENTARY VOLUME

THE NEW ENGLAND STATES

BY

PHILIP EMERSON

PRINCIPAL OF COBBET SCHOOL, LYNN, MASS.

New York

THE MACMILLAN COMPANY

LONDON: MACMILLAN & CO., LTD.

1905

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Set up and electrotyped August, 1901. Reprinted July, August, 1902; July, August, 1904; September, 1905.

PREFACE

THIS Supplement is designed for use during a portion of one of the closing years of the grammar school course, and is based upon the previous books of the Series. The work accords with the Series in its causal treatment of geography and in the full presentation of more important topics. In harmony with the chapter on Industry and Commerce in the First Book on Home Geography, the social and industrial life of New England have been traced through their development from pioneer days, thus making clear the gradual action of geographic controls, and affording a vantage ground of contrast whereby present geographic conditions may be appreciated. This historical treatment of New England industries and the related consideration of all important cities has made it possible to avoid the uninteresting lists of cities and towns with their products, which comprise so large a part of many state supplements. To the same end, the communities of each state are considered collectively in the physiographic districts and industrial groups to which they belong, thus avoiding useless repetition and leaving a series of clear impressions which will abide with the pupil.

Hearty acknowledgment for valuable criticism is not only due to the authors of the Series, but also to fellow-teachers, notably Mr. W. C. Moore, instructor in geog-

raphy at the State Normal School, Salem, Mass. In addition the several sections of the Supplement have been reviewed by specialists having expert knowledge of the topic therein treated. Specially helpful suggestions were given as to Physiography by Miss E. F. Fisher, instructor in geography at Wellesley College, and by Mr. F. S. Gulliver of St. Mark's School; on Social and Industrial Development, by Mr. Henry Barrett Learned, Instructor in History in the Sheffield Scientific School of Yale University; on the Fishing Industry, by Mr. John J. Pew of Gloucester; on Lumbering, by Mr. S. W. Matthews, Commissioner of Industrial Statistics in Maine; on Agriculture, by Professor J. L. Hills, Director of the Agricultural Experiment Station of Vermont, and by Mr. G. M. Whitaker, Editor of the *New England Farmer;* on Quarrying, by Professor G. H. Perkins, State Geologist of Vermont; on Textile Manufacturing, by Principal W. W. Crosby of the Lowell Textile School and by the editors of the *Textile World.*

The two relief maps were drawn from the charts of the United States Geological Survey by Mr. G. E. Russell, Mr. A. B. White, and Mr. C. M. Fosdick, instructors in the Massachusetts Institute of Technology. Figures 3, 7, 11, 37, 38, 39, 45, and 47 are reproduced from photographs loaned for the purpose from the Gardner Collection at Harvard University. Photographs loaned by the Bangor & Aroostook R. R. are reproduced in Figures 24, 25, 60, and 61.

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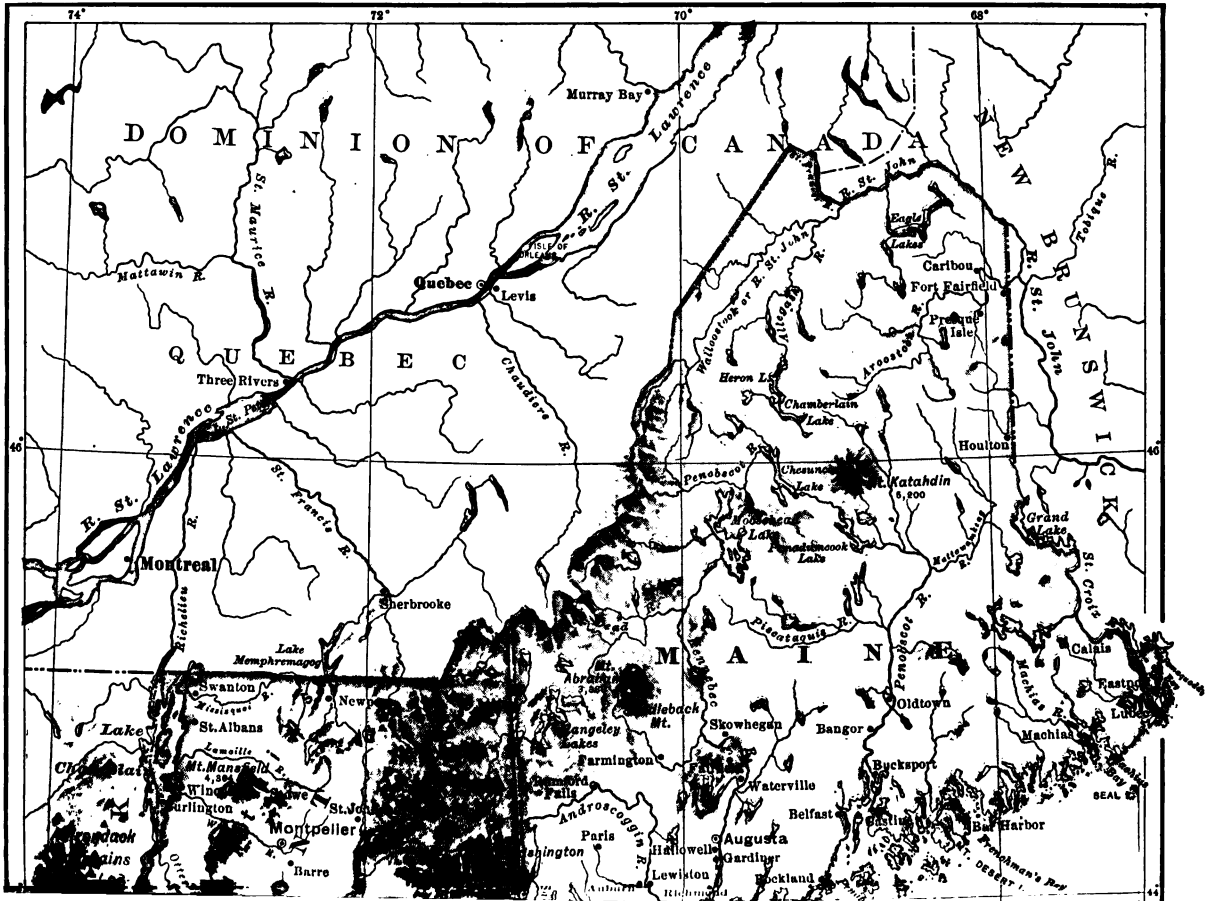
THE NEW ENGLAND STATES


74°
72°
70°
68°
46°
44°
DOMINION OF CANADA
QUEBEC
NEW BRUNSWICK
MAINE
Murray Bay
St. Lawrence R.
St. Maurice R.
Mattawin R.
Quebec
Levis
ISLE OF ORLEANS
Three Rivers
St. Peter L.
Chaudiere R.
Montreal
St. Lawrence R.
St. Francis R.
Richelieu R.
Sherbrooke
Lake Memphremagog
Swanton
Newport
St. Albans
Lake Champlain
Winooski R.
Lamoille R.
Mt. Mansfield 4,364
Winooski R.
Burlington
Montpelier
St. John
Barre
Green Mts.
Otter Creek
Adirondack Mts.
Mt. Abraham 4,050
Mt. Bigelow 4,150
Mt. Kineo
Moosehead L.
Penobscot R.
Kennebec R.
Sebec L.
Sebec R.
Piscataquis R.
Pleasant R.
Mattawamkeag R.
Mattawamkeag or E. St. John R.
Allagash R.
St. John R.
Aroostook R.
Heron Lake
Chamberlain Lake
Eagle Lake
Caribou
Fort Fairfield
Presque Isle
Houlton
Tobique R.
Chesuncook Lake
Pemadumcook Lake
Katahdin 6,200
Grand Lake
St. Croix R.
Calais
Eastport
Lubec
Machias R.
Machias
Machias Seal I.
Cutler
Bar Harbor
Frenchman's Bay
Desert
Oldtown
Bangor
Skowhegan
Bucksport
Belfast
Waterville
Augusta
Gardiner
Hallowell
Rockland
Lewiston
Androscoggin R.
Farmington
Rangeley Lakes
Dixfield
Paris
Norway
Portland
Saco R.
Saco
Biddeford
Kennebunk
Sanford
Springvale
Alfred
Wells
Ogunquit
York
Kittery
Portsmouth
Dover
Rochester
Somersworth
Great Falls
Berwick
Exeter
Newmarket
Hampton
Seabrook
Salisbury
Amesbury
Newburyport
Merrimac R.
Lawrence
Andover
Lowell
Nashua
Nashua R.
Merrimack R.
Concord
Manchester
Hooksett
Suncook
Pembroke
Penacook
Hopkinton
Contoocook R.
Peterborough
Keene
Ashuelot R.
Winchester
Hinsdale
Brattleboro
Connecticut R.
Vernon
Northfield
Montague
Greenfield
Deerfield R.
Deerfield
Shelburne Falls
Charlemont
Hoosac Mts.
Hoosac Tunnel
Williamstown
North Adams
Mt. Greylock 3,505
Pittsfield
Lenox
Stockbridge
Great Barrington
Housatonic R.
Berkshire Hills
Taconic Mts.
Lebanon Springs
Hudson R.
Albany
Troy
Schenectady
Saratoga
Saratoga Springs
Lake George
Lake Champlain
Ticonderoga
Whitehall
Fort Edward
Glens Falls
Hudson Falls
Sandy Hill
Fort Ann
Granville
Poultney
Castleton
Fair Haven
Rutland
Wallingford
Manchester
Bennington
Hoosick
Hoosick Falls
Cohoes
Mohawk R.
Schoharie Creek
Schoharie
Cobleskill
Middleburgh
Sharon Springs
Cherry Valley
Canajoharie
Fonda
Johnstown
Gloversville
Amsterdam
Schenectady
Scotia
Ballston Spa
Mechanicville
Stillwater
Waterford
Lansingburgh
Troy
Rensselaer
Hoosick R.
Walloomsac R.
Battenkill R.
Batten Kill
Mettawee R.
Poultney R.
Otter Creek
Lemoille R.
Winooski R.
Onion R.
Missisquoi R.
Richelieu R.
Lake Champlain
Isle La Motte
North Hero
South Hero
Grand Isle
Alburgh
Rouses Point
Champlain
Chateaugay
Malone
Franklin
Saranac R.
Saranac Lake
Lake Placid
Ausable R.
Ausable Chasm
Keeseville
Plattsburgh
Chazy
Beekmantown
Dannemora
Mooers
Ellenburgh
Clinton
Essex
Willsboro
Westport
Elizabethtown
Lewis
Moriah
Port Henry
Crown Point
Ticonderoga
Whitehall
Fort Edward
Glens Falls
Hudson Falls
Sandy Hill
Fort Ann
Granville
Poultney
Castleton
Fair Haven
Rutland
Wallingford
Manchester
Bennington
Hoosick
Hoosick Falls
Cohoes
Mohawk R.
Schoharie Creek
Schoharie
Cobleskill
Middleburgh
Sharon Springs
Cherry Valley
Canajoharie
Fonda
Johnstown
Gloversville
Amsterdam
Schenectady
Scotia
Ballston Spa
Mechanicville
Stillwater
Waterford
Lansingburgh
Troy
Rensselaer

NEW ENGLAND STATES
Scale of Miles.
0 25 50 100
Cities with over 1,000,000: New York
Cities with 500,000 to 1,000,000: Boston
Cities with 200,000 to 500,000: Montreal
Cities with 50,000 to 200,000: Portland
Cities with 25,000 to 50,000: Holyoke
Smaller Places: Rutland
Capitals with less than 25,000: Augusta
State Capitals: ⊙ Other Cities: •
ATLANTIC OCEAN
Longitude West from Greenwich
72° 70° 68°
42°
44°
THE M.-H. CO.
Portland
Boston
New York
Albany
Montreal
Hartford
Providence
Worcester
Springfield
Lowell
Lawrence
Manchester
Concord
Portsmouth
Newburyport
Gloucester
Salem
Lynn
Chelsea
Cambridge
Somerville
Newton
Quincy
Brockton
Weymouth
Fall River
New Bedford
Taunton
Plymouth
Provincetown
Cape Cod
Cape Cod Bay
Massachusetts Bay
Monomoy Pt.
Nantucket Sound
Nantucket I.
Martha's Vineyard I.
No Man's Land
Block I.
Narragansett Bay
Newport
Pt. Judith
Stonington
Montauk Pt.
Fishers I.
Long Island Sound
LONG ISLAND
New York
Bridgeport
New Haven
New London
Norwich
Middletown
Meriden
Waterbury
Danbury
Ansonia
Derby
Stamford
Bristol
New Britain
Hartford
Rockville
Thompsonville
Springfield
Westfield
Holyoke
Chicopee
Spencer
Southbridge
Milford
Worcester
Amherst
Northampton
Pittsfield
Greenfield
North Adams
Northfield
Gardner
Fitchburg
Winsted
Putnam
Pawtucket
Woonsocket
Bristol
Newport
Pt. Judith
Narragansett Bay
Westerly
Stonington
Fishers I.
Block I.
Nantucket
Martha's Vineyard I.
No Man's Land
Monomoy Pt.
Cape Cod
Cape Cod Bay
Massachusetts Bay
Boston
Lynn
Chelsea
Salem
Lawrence
Lowell
Somerville
Cambridge
Newton
Quincy
Brockton
Weymouth
Fall River
New Bedford
Taunton
Plymouth
Provincetown
Newburyport
Gloucester
Portsmouth
Isles of Shoals
Exeter
Haverhill
Nashua
Manchester
Concord
Dover
York
Piscataqua R.
Rochester
South Berwick
Biddeford
Saco
Kennebunk
Westbrook
Portland
Brunswick
Auburn
Richmond
Sebago Lake
Lake Winnipesaukee
Laconia
Franklin
Grafton
Claremont
Keene
Bennington
Manchester
Bellows Falls
Hanover
Hartford
Rutland
Castleton
Brandon
Randolph
Albany
Hudson R.
Mohawk R.
Connecticut R.
Merrimac R.
Thames R.
Buzzards Bay
Vineyard Sd.
Penobscot Bay
Lake Champlain
Lake George
Green Mts.
Taconic Mts.
Berkshire Hills
NEW YORK
VERMONT
NEW HAMPSHIRE
MASSACHUSETTS
CONNECTICUT
RHODE ISLAND
THE M.-H. CO.

FIG. 1.

GENERAL VIEW OF NEW ENGLAND

MAP QUESTIONS AND SUGGESTIONS. — *Political Maps.* (1) Draw an outline of North America; show the boundaries of the United States, and darken the New England States. (2) Draw a map of the North Atlantic Ocean, and indicate the course of steamers plying between New England and Europe. (3) Compare the area of the New England states with that of one of the other groups of states. Use tracing paper and draw one section within the other. (4) Compare the position of the main divide between rivers flowing to the Atlantic Ocean and to the St. Lawrence or Hudson rivers with the position of the northern boundary of New England. (5) Compare the position of this divide with that of the highest mountain peaks. (6) Indicate the general form of New England by seven straight lines. (7) Draw an outline of the New England states (Fig. 6). Omit details. Insert the state boundaries and the large rivers. (8) Draw or trace the outlines of several large lakes from the state maps. In what respect are the outlines alike?

Relief Maps (Figs. 2 and 49). (9) Reproduce the relief of some part of each map with chalk at the blackboard, or with a soft pencil on paper. (10) Find on the colored maps the names of the rivers, mountains, and other features shown on the relief maps. (11) Compare the relief maps with the pictures of the same districts to get a better idea of the surface form. (12) Try to describe *briefly* the arrangement of the peaks of the White Mountains. Is the arrangement regular or disorderly? (13) Where is there a long lowland in western Massachusetts and Connecticut (Fig. 2)? (14) Find rivers that flow for part of their course along narrow valleys and in part through broad valleys? (15) Where are mountains most numerous and highest? (16) Find mountains that rise from a valley? (17) Where are there mountains rising from the upland? (18) Compare the relief maps with state maps showing the railways. How has the relief influenced the course of the railways?

Fig. 2.
Western Massachusetts and Connecticut.

PHYSIOGRAPHY

Position and Size. — In the northeast corner of the United States, the older Appalachian ranges, and the Piedmont belt on their eastern base, broaden to form the New England upland. Nearer Europe than any other section of our country, its shores were those first

FIG. 3.

The Deerfield valley at Zoar. A tributary valley enters at the right.

visited by people from northern Europe, and settlements here multiplied early. Its position favors commerce with Europe. Although but about one-fiftieth of the area of the United States, New England has a fifteenth of the total population of the country, and a still larger proportion of its wealth. The study of this marked development of the land's resources by its sturdy people may well be interesting.

Relief. — What kind of a land is it? Travelling inland from the coast, one sees everywhere hills and valleys of

varied form; in fact, the country seems all hills. Still farther inland the main valleys are deep, and when one climbs a hill, broad tracts of rolling country are seen at about the same height as the hilltops near the rivers (Fig. 47). This upland surface often suggests a plain, in contrast with the steep-sided valleys or with the mountains that rise singly and in groups above it. Indeed, if the valleys were filled, a great rolling plain would result.

The hard crystalline rocks of this mountain-studded

FIG. 4.

View from Canada border, over Lake Memphremagog. Notice the Green Mountains rising from the upland of Vermont.

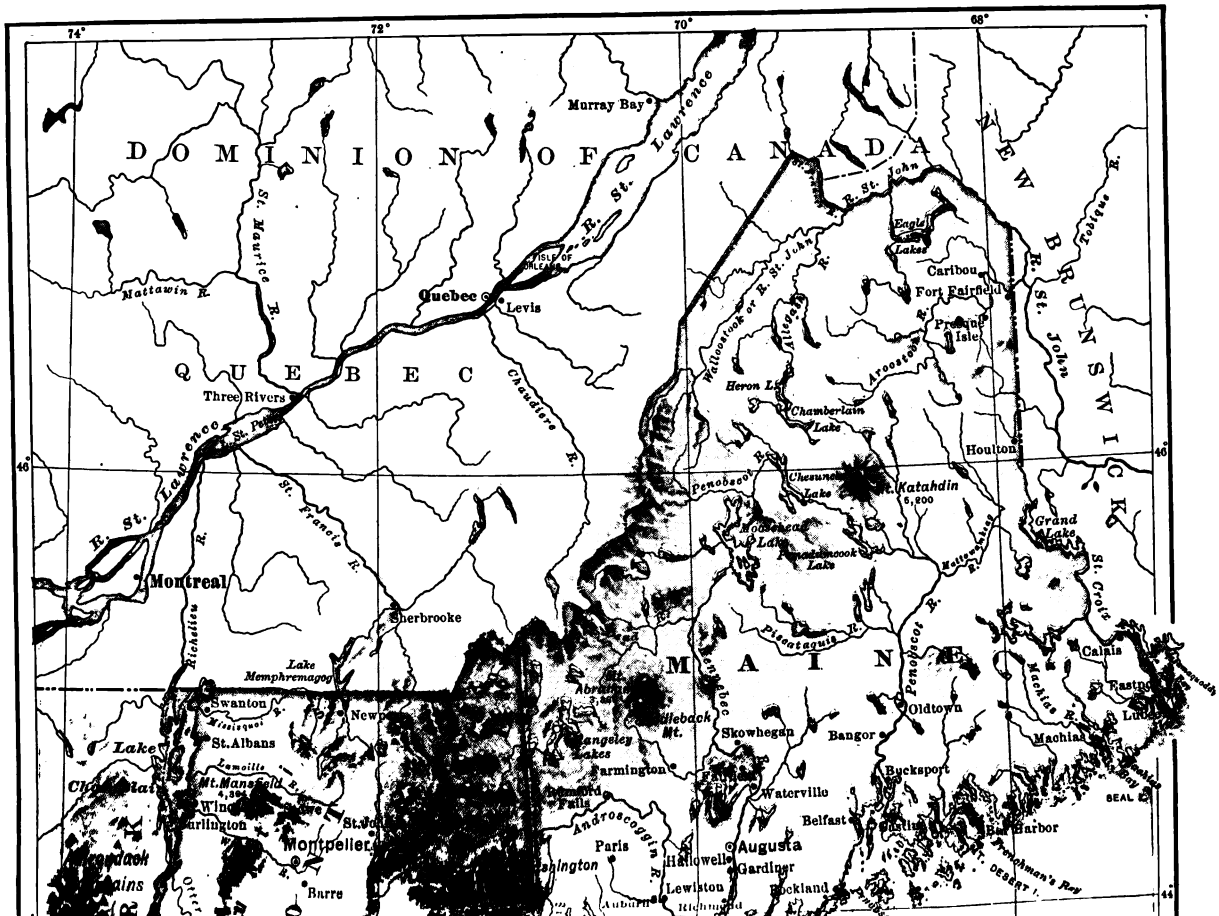
plateau and the folded and broken strata tell us that it is the remnant of ancient mountains. During long-past ages weathering and river action slowly wore away the mountain folds to a rather even surface, sloping gently to the sea. Some of the rocks, however, were too resistant to yield, and rose above the almost-plain, or *peneplain*, as rocky hills or mountains (Figs. 24 and 49). Finally, the earth's crust was gently raised, changing the low peneplain to an upland, one or two thousand feet high in the interior, sloping to the Atlantic and toward the Hudson and St. Lawrence valleys. The rivers flowed

swiftly down these slopes and slowly cut out many deep valleys. Where the rocks are easily worn, as in the Connecticut Valley below Greenfield, the valleys are broad; elsewhere they are narrow and have steep side slopes.

FIG. 5.

Looking north from above Franconia Notch (p. 93), White Mountains. Echo Lake, Profile House, and Eagle Cliff in foreground.

The elevations above the upland are irregular in form (Fig. 49) and distribution. Some, like the summits of Mt. Desert Island, rise near the coast; others, such as Mt. Monadnock in New Hampshire, rise singly from the upland. The Green Mountains extend north and south through Vermont; and a succession of peaks, of which Mt. Katahdin is the highest, crosses Maine. The White Mountains form an extensive mountainous area in New Hampshire, where Mt. Washington and some other peaks rise over a mile above sea level.



74°
72°
70°
68°
46°
44°
DOMINION OF CANADA
QUEBEC
NEW BRUNSWICK
MAINE
Murray Bay
R. St. Lawrence
St. Maurice R.
Mattawin R.
Quebec
Levis
Three Rivers
Chaudiere R.
St. Francis R.
Richelieu R.
Montreal
Sherbrooke
Lake Memphremagog
Swanton
St. Albans
Lake Champlain
Mt. Mansfield
Burlington
Montpelier
Barre
Lamoille R.
Wallooostook or R. St. John
Allegash R.
Heron L.
Chamberlain Lake
Aroostook R.
Eagle Lakes
Caribou
Fort Fairfield
Presque Isle
Houlton
Tobique R.
R. St. John
Penobscot R.
Chesuncook Lake
Mt. Katahdin
6,200
Moosehead Lake
Pemadumcook Lake
Grand Lake
St. Croix
Mattawamkeag R.
Piscataquis R.
Penobscot R.
Calais
Eastport
Machias R.
Machias
Oldtown
Bangor
Bucksport
Skowhegan
Farmington
Waterville
Belfast
Bar Harbor
Augusta
Gardiner
Hallowell
Lewiston
Rockland
Paris
Androscoggin R.
Mt. Abraham
Mt. Bigelow
Mt. Kennebec
Mt. Sugarloaf
Mt. Blackback
Mt. Bangeley
Lakes
Rumford Falls
Franklin
Frenchman's Bay
Mt. Desert I.
SEAL

NEW ENGLAND STATES
Scale of Miles.
0 25 50 100
Cities with over 1,000,000: New York
Cities with 500,000 to 1,000,000: Boston
Cities with 200,000 to 500,000: Montreal
Cities with 50,000 to 200,000: Portland
Cities with 25,000 to 50,000: Holyoke
Smaller Places: Rutland
Capitals with less than 25,000: Augusta
State Capitals:
Other Cities:
ATLANTIC OCEAN
Massachusetts Bay
Cape Cod Bay
Cape Cod
Monomoy Pt.
Nantucket Sound
NANTUCKET I.
MARTHAS VINEYARD I.
NO MAN'S LAND
Buzzards Bay
Narragansett Bay
Pt. Judith
BLOCK I.
Montauk Pt.
FISHERS I.
Long Island Sound
LONG ISLAND
New York
CONNECTICUT
RHODE ISLAND
MASSACHUSETTS
Boston
Lynn
Chelsea
Lawrence
Lowell
Somerville
Cambridge
Malden
Salem
Beverly
Gloucester
C. Ann
Newburyport
Haverhill
Nashua
Manchester
Concord
Keene
Exeter
Dover
Rochester
Portsmouth
ISLES OF SHOALS
Piscataqua R.
York
South Berwick
Kennebunk
Biddeford
Saco
Portland
Westbrook
Brunswick
Richmond
Laconia
Lake Winnipesaukee
Merrimac R.
Claremont
Grafton
Hanover
Hartford
Randolph
Castleton
Mohawk R.
Albany
Hudson R.
North Adams
Greenfield
Pittsfield
Northampton
Amherst
Holyoke
Westfield
Springfield
Chicopee
Northfield
Fitchburg
Gardner
Worcester
Spencer
Southbridge
Milford
Marlboro
Newton
Natick
Quincy
Weymouth
Brockton
Provincetown
Plymouth
Taunton
Fall River
New Bedford
Woonsocket
Pawtucket
Providence
Bristol
Newport
Westerly
Stonington
Thames R.
Thompsonville
Putnam
Rockville
New Britain
Hartford
Winsted
Bristol
Waterbury
Meriden
Middletown
Norwich
New London
Ansonia
New Haven
Danbury
Derby
Bridgeport
Stamford
42°
72°
70°
68°
Longitude West from Greenwich
THE M.-N. CO.

Fig. 1.

in the ocean, and only in Maine has the uplift of the land been sufficient to raise these clay beds above the sea.

Moraines were also formed here and there as the glacier paused in its retreat, and its load of waste was so irregularly deposited that many valleys were dammed, thus forming most of our numerous lakes. Many of the smaller and shallower glacial ponds have been filled by stream deposits and plant growth, and are now swamps and meadows. Often the glacial deposits have turned streams from their courses over low divides. Where these streams tumble over the steeper slopes there are rapids and falls; and some streams have worn small gorges, which have an origin similar to that of the famous gorge of the Niagara River. The larger rivers remain in their former valleys for the most part, but here also there are occasional falls where the rivers have uncovered ledges, as explained below.

As the glacier retreated, the rivers were overburdened with sediment from the melting ice; and broad, sandy flood-plains were formed in the valleys, the deposits often being deep enough to cover rocky knolls. Since then the rivers have been able partly to cut away these flood-plains (Fig. 10), and as they have changed their courses from side to side, ever cutting deeper, terraces have been left to mark the different levels. Houses and roads are on the upper terraces, safe from floods, while the moister and more fertile farm lands are on the present flood-plains and lower levels. These terraced plains form the beautiful elm-dotted intervales along New England rivers. In cutting their channels such rivers have happened on some of these buried ledges (Fig. 14), and have formed falls where the water tumbles over the rocks. Where such falls occur toward the mouths of large rivers, they afford our most valuable water power (p. 23). Why especially valuable there?

FIG. 9.

Glacial sands and gravels, now covered by the waters of the Nashua Reservoir (p. 69). The upper view shows gravel ridges formed of the coarse rock-waste deposited in the ice channels of streams flowing beneath the glacier. There are many miles of such ridges scattered over New England. The middle view shows an extensive sand-plain, once a delta. Below is pictured a little valley in the sand-plain, formed when a mass of ice that had been buried in the sand melted. Such *kettle holes* are common in sand-plains.

From the days of the first grist mill these falls have been of great importance to New England. The forests, the porous glacial soil, and the great natural reservoirs of the many lakes, all combine to hold back the water of heavy rains and deliver it in a steady flow. This water power has given a basis for the start of very important manufacturing industries. It is to-day being still further developed, and its usefulness extended by generating electricity.

Coast. — After the peneplain had been raised, and this upland cut by valleys to nearly its present form, the coastal

FIG. 10.

Bank of Connecticut River, Hadley, Mass. Looking toward Mt. Tom and Mt. Holyoke. The river has almost cut away the road. The lowest terrace is at the right, the broad second terrace at the centre and left.

belt was slowly depressed. This permitted the sea to cover the lower portions of the uneven land and thus form a very irregular coast line. Our harbors are simply drowned valleys, while the tide flows far inland along the larger rivers, notably the Connecticut, Penobscot, and Kennebec. The islands and peninsulas of the very irregular coast of Maine (Fig. 11) are the higher hilltops of that part of the upland.

This rugged coast has strongly influenced the industries of the section. The many good harbors have enabled the development of fishing, shipbuilding, and

commerce (p. 20); and since commerce is necessary for extensive manufacturing, the coast line has influenced that important industry also.

The waves are at work making cliffs on the headlands, while the currents carry the waste along shore to form pocket beaches in the coves, or to build bars across the shallow bays, as between Casco Bay and Cape Ann (Fig. 35). The exposed morainic sands of Cape Cod, which the waves are wearing away (Fig. 39), have supplied the sand which has been swept

FIG. 11.

Bar Harbor, Maine.

northward to build the hooked spit at Provincetown, with its drifting sand-dune hills, and southward to form Monomoy Island, a barren sandbar. In the protected lagoons, behind sandbars, and in shallow harbors along the coast, the waste has been built up into grassy salt marshes (Figs. 37 and 46).

On harborless sandbar coasts and along the dangerous reefs and winding channels of rocky shores, there are numerous lighthouses (Fig. 39) to guide the coasting schooners and other craft. The United States government also maintains life-saving stations, where men are ever on the watch during the stormy part of the year, ready to rescue lives from wrecks. The nation spends much money also in dredging harbor chan-

FIG. 12.

Life boat, Cape Cod. The wreck and line of breakers mark a shoal formed by sands swept northward from the Cape Cod cliffs.

nels to make them deep enough for modern vessels, and in making harbors of refuge where natural ports are lacking.

SUMMARY. — *The New England upland is an old mountain region, worn to a low plateau, or peneplain, above which mountains rise, and into which valleys have been cut, dividing much of the surface into hills. Most people live in the broad valleys near the coast. The glacier has left a stony soil, and many moraines, drumlins, and sand plains, damming the valleys with waste at many points and causing lakes and falls, which afford water power. The land has sunk, giving an irregular coast line and many harbors.*

CLIMATE

New England is midway between the equator and the north pole, not so far north that its harbors are closed by ice in winter, nor so far south that the climate lessens the vigor of its people. Since the westerly winds bring the changing temperature of the interior, New England winters are severe; but the summers are warm enough for the growth of all the grains, fruits, and vegetables of cool

temperate lands. The early English settlers did not understand this, but expected to find mild winters in these latitudes, farther south than their homeland, where winds from over the warm ocean moderate the cold of winter. The disappointment and disaster due to the unforeseen severity of the winter season explain the failure of early settlements and the hardships of the Pilgrims.

The great extent of New England from north to south, and the contrast between the cold waters of the Labrador current north of Cape Cod and those influenced by the Gulf Stream to the south, give much variety of climate. Thus while the forested uplands near the Canada border are buried deep with snow, there is little sleighing on the lowlands near the southern coast.

Not only does New England lie on a leeward coast, with both cold and warm currents near by, but also in the usual path of the cyclonic storms from the west and occasionally of hurricanes from the West Indies. Its weather from autumn to spring is therefore disagreeably stormy and changeable. Because the lower air moves from all directions toward the centre of an area of low pressure, the passage of a storm is marked by changing winds. Southeast winds from the Gulf Stream bring winter rains as they rise over the upland. Such a wind may change to a cold "northeaster" with driving snow, — a "blizzard," strewing the coast with wrecks. As a storm passes out to sea, the prevailing northwest winds of winter bring the clear skies of a cold wave, with the mercury often well below zero on the uplands. Then the southwest winds — in advance of another area of low pressure — may change the snow of southern New England to the slush of a "January thaw." Similarly the frosts of clear nights in spring and fall occur during periods of northwest winds; and the hot spells of summer are due to the southwest winds which prevail at that season.

In summer the sun is high in the sky at noon, and the contrasts between day and night are marked. While the days are often intensely hot, — except near the coast, where the refreshing sea breeze is felt, — the nights are usually clear and comfortable. Cumulus clouds fleck the summer sky, forming in the forenoon when the sun has so heated the ground that the currents of heated air rise actively. Sometimes, as the clouds grow larger, afternoon thunder showers drift eastward across New England. These summer showers supplement the winter storms, and serve to distribute the rainfall through the year, thus favoring both agriculture and those manufacturing interests which depend upon water power.

FIG. 13.

A large cumulus cloud. Compare Fig. 5.

The sudden and severe changes in winter make the climate of New England a difficult one for weak constitutions. Consumption has long been a scourge here. Robust people, however, are not injured by the severe climate, and it has had a share in moulding the characteristics of the Yankee.

SUMMARY. — *New England has cold winters and hot summers, because the prevailing westerlies blow from over North America. This was quite unexpected to the early settlers from England. The changing winds of passing cyclones give repeated sudden changes in the weather, both in summer and in winter.*

SOCIAL AND INDUSTRIAL DEVELOPMENT

Settlement. — To understand the social and industrial life of New England to-day, we must know something of

the people who settled there, and of the development of their industries. For this purpose let us call to mind the story of the Pilgrims and Puritans, trace their extension over New England, and note the development of their simple mode of life into the complex conditions of the present century.

In the early part of the seventeenth century the cause of popular liberty seemed hopeless throughout Europe. Many people were ready to leave the rule of king and bishop in England, in order to found a new English home in North America, where they might govern both church and state as they willed.

First came the little band of Pilgrims, who, contrary to their plan of settling south of the Hudson River, were driven by autumn storms to the north of Cape Cod. So stout-hearted were they that, in spite of many deaths, the little colony remained at Plymouth, and proved that in this land of cold and stormy winters successful settlement was possible. As matters grew rapidly worse in England, the Puritan leaders secured a charter from the king to plant a colony on Massachusetts Bay. This led a large emigration hither, the first settlements being about Salem and Boston. Over twenty-five thousand people came to southern New England in ten years; but then the movement nearly ceased, because new hope arose that the contest for political freedom in England would be successful.

These settlers were all English, most of them coming from a few counties of eastern England. With the exception of a very few Scotch Presbyterians and French Huguenots, who came later, they remained for a century and a half to multiply and to possess the land without the intervention of others. No other section or country

has been thus settled by a large body of distinctively English people of the middle classes. They were the best of English blood, including many country squires and people of means and education from English towns. There were sturdy farmers, prosperous tradesmen, skilful craftsmen, hardy seamen, — and all were as thrifty and energetic as have been the best of their descendants to this day.

The movement of so many people to a land of savages, in the little ships of those times, was really wonderful; and, because of the hardships to be endured, only the more determined and vigorous left their homes. Accordingly the people of New England have been a distinct type in American life, even as the land is a distinct surface feature. Their energy, love of education, and habit of local self-government have been carried by their children westward through all the northern states to the Pacific Ocean.

The Puritans did not believe in religious freedom, and bitter disputes over religious and political matters arose at the start. This led many settlers to leave Massachusetts and found groups of towns about Hartford and New Haven, Providence and Newport, and within the colony of New Hampshire. The southern settlements were formed into the colonies of Connecticut and Rhode Island under royal charters. Maine and Plymouth were united to Massachusetts Bay Colony by the king. Thus were laid the foundations of several New England states.

Most of the early villages were scattered along the coast and along the fertile terraces of the Connecticut Valley, where they could communicate with each other by water. However, settlements were pushed inland along the valleys, until checked by the long and bloody struggle of King Philip's War. The sickness that carried off so many of the Indians between Nar-

ragansett Bay and the Penobscot River, together with the terrible destruction of the Pequots when that tribe attacked the Connecticut River settlements, opened the way to the founding of many towns. But even after the destruction of the Indians of southern New England, attacks by French and Indians from the north, during the several colonial wars, made the extension of settlements dangerous and slow. After Queen Anne's War, however, farms were pushed outward over the uplands of southern New England (Fig. 53). Thus, early in the nineteenth century the frontier had reached the Canadian border of Vermont, and the great forest belt of the White Mountains and Maine. Since then there has been little further occupation of the land, except in the valleys of Aroostook County, along the northeastern border of Maine (p. 109).

New England life changed slowly during the two pioneer centuries. The families that gathered before the great fireplaces were large, and as the children married they moved on and took up new land. Here they cleared the forest, piled the boulders into stone walls, and raised on their farms the necessities of life, including grain and meat, which are now brought from the West.

Travel was difficult over the poor roads, so every community depended on itself, and every farmer was an independent manufacturer. He built his own house, fashioned rude furniture, raised wool and flax for homespun clothing, made his own soap and candles, and in many cases made his own shoes from hides tanned with hemlock bark; in fact, he met all the necessities of shelter, food, and clothing. There was hard work for all the household, save on the day of strict Sunday rest; even the amusements were neighborhood gatherings for house-raisings and corn-huskings, spinning-bees or quilting-bees. While this movement to the frontier continued, no large towns could develop, and in 1800 Boston was the only town as large as the smaller cities of Massachusetts to-day.

Early Commerce. — The tide of human life had hardly risen over the uplands to the mountain slopes, when it

began to recede slowly. There were lands of greater fertility in New York and the prairies beyond, and many sought new homes westward. The older towns had long passed the pioneer stage, and their growing prosperity called for goods from over the seas. This led many young men of enterprise and ability to leave the quiet, plodding life of the farm to seek the opportunities of a growing commerce in the stirring seaport towns. At every sheltered harbor, and at every river mouth, little vessels were built, for which the forests supplied abundant material; and these craft carried fish, lumber, and surplus farm products to England, southern Europe, and the West Indies. After independence was secured, trading voyages were extended to China and the East Indies; and manufactured goods and tropical products were brought home.

The farmers and villagers sent their products to the nearest ports, because only rough roads connected the harbors with interior places, and transportation was costly. Many coast towns shared the commerce, therefore, and grew rich on its profits. From the more remote uplands the farmers made annual trips, with heavily laden wagons, to the larger ports, returning with lighter loads of goods purchased from the merchants.

A century ago SALEM was the second town in New England (p. 124), with more shipping than any other port of the nation. In those days PROVIDENCE (p. 77) had a larger fleet of vessels than New York, and PORTLAND long maintained a more extensive trade with the West Indies than either Boston or New York. MIDDLETOWN was once the largest town of Connecticut; but like many places whose early commerce gave them importance, it has been outstripped by those better situated for later conditions.

As competition increased, swifter and larger vessels came into use, and New England master builders developed the type of clipper ships which surpassed in speed the vessels of other nations, and gained for the United States a large share of the carrying trade of the world. Their voyages are still a wonder, even in this day of swift steamers. The *Flying Scud*, for example, sailed five hundred miles during one favorable day.

Shipbuilding naturally became centred at a few places where the more skilful masters and workmen were located. Moreover, as ships increased in size, only the deeper harbors could be used extensively, and smaller ports declined in importance. But after the Civil War the making of iron steamships in England, and other causes, brought about a decline in wooden shipbuilding in America. The construction of barges and great four and five masted schooners at BATH and a few other Maine ports (p. 114) is now the most important form of the industry.

The increase of population in the interior demanded better means of transportation between inland towns and the seacoast than the roads afforded. Many canals were planned and two were built, one from Lowell to Boston, another from New Haven to Northampton. But the extension of canals was checked by the invention of the steam engine and the construction of railways. In time railways were built to all parts of New England, radiating from the harbors most favorably situated, and the less favorably situated ports lost their commercial importance in consequence. While coasting vessels still bring coal, building materials, etc., to many coast cities, the foreign commerce of New England at the present day is mainly carried on from Boston and from New York City.

Early Manufacturing. — In colonial times, England restricted the manufacture of goods in New England in order that she might compel the purchase of her own

products. But when the Revolution secured industrial freedom, New England used the wealth gained in commerce to erect other factories than the early saw and grist mills. Many hands were needed to care for the machinery, and thus the movement of population from the uplands to the valleys greatly increased.

FIG. 14.

Granite face of dam at Holyoke, one-fifth of a mile long. Notice the gate house, on the farther side, whence canals lead through Holyoke.

The Embargo Act of 1807 and the War of 1812 checked our commerce, and the consequent lack of manufactured goods led the merchants to invest their idle capital in manufacturing. In the years that followed, water rights were secured at the falls of our large rivers, and dams were built at great cost (Fig. 14). The abundant waters were led along the valley sides in canals, which could supply water power for rows of factories built beside them. Thus the cities of LOWELL, LAWRENCE, MANCHESTER, LEWISTON, and HOLYOKE sprang into existence.

As the use of steam power increased, many cities that were able to obtain coal cheaply by water replaced their failing commerce by manufacturing interests. SALEM, NEW BEDFORD, PROVIDENCE, NEW HAVEN, and BRIDGEPORT are prominent cities of this type. This introduction of steam aided the towns, such as HARTFORD, TAUNTON,

and HAVERHILL, that had developed at the limit of navigation on rivers. It was likewise of advantage to those whose situation, where falls occur close to tidewater, had from the first combined cheap water power and facility for importing raw materials. Illustrations of this class are AUGUSTA, BRUNSWICK, BIDDEFORD, SACO, DOVER, FALL RIVER, PAWTUCKET, and NORWICH. Other inland manufacturing cities rose to importance because of their railway connections, notably WORCESTER and SPRINGFIELD. A few railway towns, like MERIDEN and NEW BRITAIN, have become thriving cities because of the special business talent of their citizens. Make a map of New England and indicate upon it the position of these cities.

Railways. — The new industrial conditions, as a result of which goods were manufactured in city factories instead of in farm homes, demanded railways to bring raw materials and to remove the products to market. Therefore railways were extended inland along the valleys. The Berkshire upland was crossed by one line, and a tunnel under Hoosac Mountain made way for another line from the Deerfield valley to that of the Hoosac. Both of these, by connecting Boston with the West, have contributed largely to that city's growth. Trace (Fig. 35) the valleys followed by these two lines. Note also how the railways follow the valleys in crossing the uplands of New Hampshire and Vermont. (Fig. 54.)

Very naturally, for economy and ease of working, connecting railways were combined into through lines; and more recently competing lines have been formed into great railway systems. The Boston and Maine, in connection with the Maine Central, covers much of New England from central Massachusetts northward, connecting with Canadian roads and with the West. The New York, New Haven, and Hartford has acquired the roads of southern New England, as well as the connecting steamboat lines to New York; while the Boston and Albany

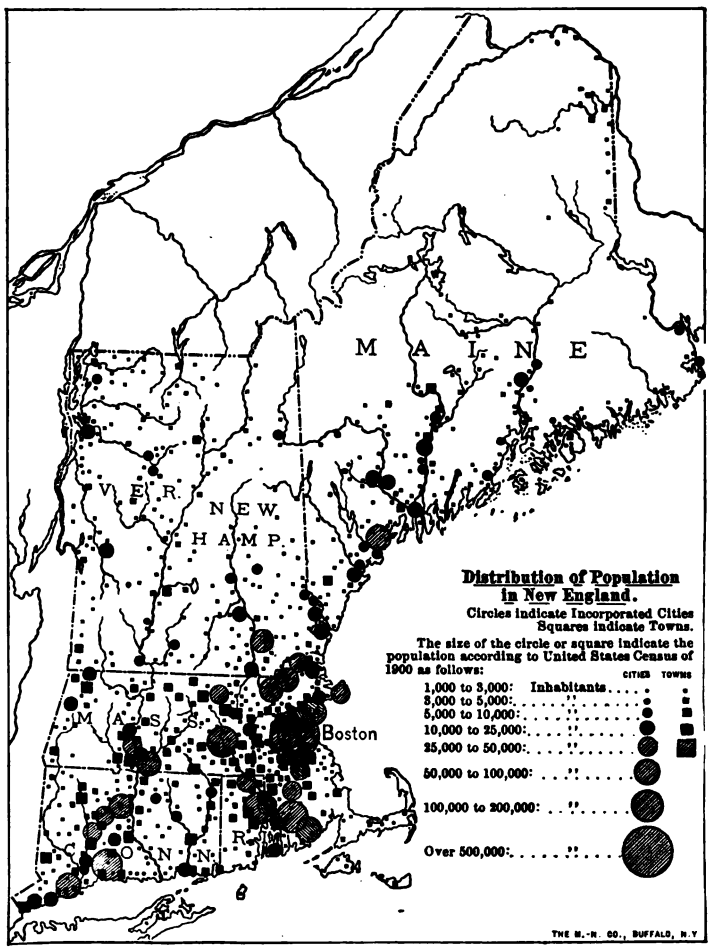


FIG. 15.

Where are the densely populated districts? In what sections are there no large towns? What is the relation of the distribution of cities and large towns to the relief? To rivers? To railways? To the seacoast? Try to discover and to state the reasons for the relations.

has become a part of the New York Central System. The Central Vermont extends to tidewater at New London; and the Grand Trunk connects Portland with Canada and the West.

This network of steel rails, spun closely over the lower coastal region and threading the interior valleys, has strongly influenced the distribution of population (Fig. 15). The interior cities of Massachusetts are along the main railway lines, and most towns not reached by rail have lost population to the gain of the manufacturing centres (p. 81).

City and Country. — The Puritans came in groups, and settled in villages about their churches, the better to resist Indian attacks. Later the tendency to settle on separate farmsteads increased; yet villages grew at crossroads and near saw and grist mills, because these places became centres of trade.

FIG. 16.

A deserted farmhouse, New Hampshire. Mt. Chocorua at the right. There are now many summer homes in this region.

While villages in the valleys have become prosperous towns and cities, those on the hills have stagnated. Many upland farms were too rocky and uneven for the use of farm machinery, and were so remote from railways and markets that they have proved unprofitable for tillage. Often the children left the dull life of those lonely farms for the attractions of the city, and when their parents died,

the deserted farms were allowed to grow up again to woodlands. To-day, in some districts, one may trace abandoned roads along the old stone walls, past cellar holes and chimney heaps and forgotten family graveyards. In the encroaching woodlands, apple trees and half-effaced plough furrows give indication of past thrift.

FIG. 17.

Country road, Westfield valley, western Massachusetts.

Although many farm districts are still losing population, rural conditions are brightening. Some farmers are improving their methods of work, guided by the agricultural colleges and experiment stations. Their sons find opportunities at home as well as in the cities. Better roads and the many lines of electric cars now make accessible many places that the railways have failed to reach.

As markets and social advantages are thus brought nearer to the farmer, he is made more prosperous and happy.

In pioneer days the early Indian trails gave way to bridle paths, and these to rough, ungraded cart roads. In time, because the towns could not afford good roads, companies were chartered by the states to build turnpike roads, with toll gates.

FIG. 18.

The road of Fig. 17 when changed to a state highway.

These extended in straight lines between important towns, up hill and down, and were long used by coach lines. When the turnpikes proved unprofitable to the companies, the plan was abandoned; and the ease for movement by rail led people to overlook the necessity for good roads. Even to-day many country roads are mended by scraping waste from the gutters into the road, and nearly every such road is a muddy morass in spring (Fig. 17) and deep in dust in summer.

At present some of the state governments are aiding the towns and counties to build better roads. Massachusetts has a system of state highways well under way at many different points, and Connecticut is following the same plan. New Hampshire and Vermont have taken first steps toward this end. Such state roads (Fig. 18) are built on gentle grades, of crushed stone, coarse underneath and fine above, rolled hard, and sloping to the sides in order to shed water. The roads thus made are mended with crushed stone as soon as the surface is worn, and therefore they are always in good condition both for rapid travel and for heavy loads.

Not only has the country been brought nearer to the city, — the city goes yearly to the country. It has become the custom for many to escape from the strain of city life by going away, for at least a fortnight, to gain new health by country fare and life, and to enjoy the beauty of upland views and drives. Coming at first as boarders in farmhouses and summer hotels, many families soon desired to live in their own country dwellings through the season; so deserted farms were bought, and old buildings repaired or new ones erected (p. 94).

These estates have enlarged the field for labor in the country. The hundreds of boarders and residents who come to many towns supply a home market for the produce of even those farmers who do not take boarders, and good prices are secured for eggs, milk, vegetables, and fruit. Through this contact with the world the outlook of the country people is broadening and the value of property is increasing.

The problems of city life and government are especially difficult, partly because several races have been brought together in the cities. In the middle of the century, famine-stricken Ireland sent scores of thousands of its

people across the Atlantic. These found work in the growing cities at many kinds of labor, and gradually replaced native workmen in the mills. After the Civil War, when much help was needed to develop the rapidly growing industries, many French Canadians crossed the border under the call of rising wages. Although some returned to Canada in a few years, more have remained as citizens of our states. Other people have come from Great Britain, and from the maritime provinces of Canada; and of late Germans, Swedes, Italians, Poles, and others have come from the continent of Europe.

FIG. 19.

An alley of the North End, Boston, — a tenement district. Compare with Fig. 20.

The poverty of the immigrants has obliged many to crowd into cheap tenements in special districts. Here bar-rooms are often conspicuous resorts, vice is prevalent, and disease flourishes because of the lack of healthy outdoor life (Fig. 19). The conditions tend to separate the races and to place rich and poor apart. But active efforts are now being made by churches and other religious and charitable organizations to remedy these evils; for in-

FIG. 20.
Commonwealth Avenue, Boston. Homes of the wealthy.

stance, they send the children and sick of the poor for brief vacations in the country. A few cities have been able to close the saloons. State laws have reduced the hours of labor, and some cities have provided small parks and playgrounds in the tenement districts. In recent years cheap and rapid transit between city and suburbs has led to the growth of the outskirts of cities, where more healthful conditions prevail.

Education.—The school system of New England, and the free public libraries found in most towns, have been pronounced means whereby the people have developed the culture for which the section is noted. The worth of such education is clearly shown in the fact that it has increased the earning capacity of the people of New England over that of states where many children have grown up in ignorance.

Many of the Puritan settlers were well educated, and they earnestly desired the education of their children, believing

this necessary to the well-being of the state and church. Therefore schools were started early, and laws were soon passed compelling parents to see that their children learned to read, and requiring all but the smallest towns to maintain public schools. *Harvard College* was founded at CAMBRIDGE when Boston was but six years old, and *Yale College* at NEW HAVEN two-thirds of a century later. Both colleges have now become great universities (p. 70). There were grammar schools in the larger towns, where the boys studied Latin grammar in preparation for college, and other schools where boys learned the "three R's," — reading, writing, and arithmetic. The youngest children, including girls, went to private schools, kept by women, — called dame schools, — where they learned the alphabet and studied the New England Primer.

When population scattered in the second century of colonization (p. 19), the town schoolmaster had to conduct a moving school from district to district, with only a few weeks or months at any one. Every district had to erect a schoolhouse, and later it was given its share of the town's school tax, with power to hire the teacher. During the troublous times of early colonial history interest in education had waned, and many of the small districts were too poor or too narrow minded to maintain good schools. The district schools were as a rule poorly taught, in miserable schoolhouses, with the rudest furniture and poor text-books. Most of the grammar schools were closed, but many academies were founded by the generous gifts of those who retained the desire for popular education, and the states gave their aid. Scattered over the counties, these academies afforded the opportunity for a good education to the boys and girls who could meet the expense. Several new colleges were founded, such as Brown, Dartmouth, Bowdoin, Williams, Middlebury, Amherst, and the University of Vermont, one of the earliest state colleges.

Toward the middle of the last century, through the efforts of such men as Horace Mann in Massachusetts

and Henry Barnard in Connecticut and Rhode Island, interest in education revived. The states appointed boards of education which gathered information and influenced public opinion, and in time town school committees were given charge of the district schools. State school funds were formed in order that the poorer towns might be aided, and state normal schools were founded for the special training of teachers.

The cities began to employ school superintendents to aid the committees, and to-day, in several states, groups of towns unite to secure district superintendents. When the large city schools could no longer gather in one room, they were divided into graded classes, each class having a teacher. With better roads and electric lines, even in some of the towns it has been possible to close the district school and bring all the children daily to a central building of graded schools. The academies are largely displaced by free public high schools, and far more pupils continue their studies beyond the elementary schools than formerly. Free text-books are now provided in New England, and the laws compelling school attendance are so strict that an education is insured to all.

Although some children attend private schools, the public schools help to bring the various races, the rich and the poor, together in equal preparation for a common citizenship. The schools are being adapted, also, to meet new problems. For instance, in the cities there are evening schools for the education of immigrants and those who leave school early in life for work; cooking, sewing, and manual training are taught, in order that home conditions may be improved; and summer vacation schools are held in city tenement districts, where the street is the only playground (Fig. 19).

INDUSTRIES

Fishing. *Development.* — Off the coast from Cape Cod to Newfoundland there are rock-strewn banks, or shoals, where plant and animal life abounds. Here feed the cod and its allies, the haddock, pollock, and hake, and a huge flatfish, the halibut. From very early days fishermen from France have resorted hither to catch the fish, curing them on shore and returning home heavily laden. The earliest Puritan settlements on Cape Ann were made for the purpose of fishing, and the sale of fish to other peoples was the basis of colonial commerce and prosperity. On the fishing boats the boys of coast towns early gained the skill and daring which took them as young men on longer voyages. The national government formerly granted subsidies to fishing vessels, because the fisheries trained American seamen for service in the navy.

Like most industries the fisheries have become centred at a few points. Formerly every little port shared the industry, but now only abandoned fish houses and old wharves remain in many places. The population of the Maine coast and of Cape Cod has decreased with the transfer of their village fisheries to the larger ports. To-day most of the schooners that sail to the fishing banks are from GLOUCESTER (Fig. 21), and its fleets number about four hundred vessels. BOSTON, PORTLAND, and PROVINCETOWN are next in importance. The outfit for a voyage can be more easily secured, and the fish better handled, cured, and marketed now that the industry is centred. This is especially true as to marketing, since many fish are now packed in ice and shipped at once to distant cities by rail. As a market for fares of fresh fish Boston excels Gloucester, since its central position and trade connections (p. 63) favor the wholesale trade.

FIG. 21.

Gloucester Harbor. Fish flakes on wharf in left foreground.

In early times the fisherman was also a farmer in summer, and engaged in lumbering, shoemaking, or shipbuilding in winter. Naturally the methods then employed were simple and primitive. By concentrating the best thought of one enterprising port on the fishing industry it has been much improved. For instance, the fishing boats which were once rude craft, are now swift, safe, and expensive schooners (Fig. 23). Again, the skins and refuse from the salt cod, formerly thrown away, are now used for the manufacture of glue and fertilizers.

As a result of these changes, the smaller fishing towns of the peninsulas and islands, like the upland villages, find their principal occupation in serving summer visitors. Many such visitors go by rail, steamer, and yacht to almost every point on the New England coast, escaping from the heated interior to the cool, salty air of the sea breezes. Those seeking rest and change formerly went to boarding houses and hotels, but now there are also many groups of cottages along shore, some inexpensive and simple, others the palaces of the wealthy. Near the former are fleets of sloops, while costly steam yachts are common at Newport and Bar Harbor (pp. 80 and 113).

Banks Fisheries. — Cod and halibut, formerly caught in abundance near shore, must now be sought on the banks, far from land, where they are still numerous. An attempt is being made, however, to restore the former abundance of cod by liberating young fish near the shore. This is done by means of fish hatcheries, — established by the national government, — in which the roe or eggs are hatched and the young cared for, for a time, then placed in the sea.

FIG. 22.

Underrunning a trawl.

Formerly all fishing was from the sides of vessels, with long hand lines. Later dories were carried on a schooner's deck, and one or two fishermen put off in each dory to fish. Many fish are still caught in these ways, but most bottom fish are now secured with *trawls* (Fig. 22). A trawl consists of short lines, with baited hooks, attached to a long ground line. Each dory is manned by two men, and has several tubs with coils of baited lines. Putting off from the schooner on the fishing grounds, one end of the ground line is anchored, and marked by a buoy; and the fishing gear is cast overboard by one man while the other rows the dory away from the vessel.

Several trawl lines are united to make a single one a mile or two in length, the other end being also anchored and marked

by a buoy. The lines remain out for a few hours, or through the night, and then the fishermen haul them into the dories and secure the fish. Where the water is not too deep, trawls for cod may be underrun; that is, the trawl is passed over the boat, the cod removed, and the hooks rebaited with pieces of fish. By this method most of the trawl is always at the bottom ready to catch fish.

On board the schooner the fish are cleaned and packed in ice, if to be sold fresh; if not, they are split, salted, and piled beneath the deck in the hold. The livers are saved for their oil, and the air bladders, which contain much gelatine, are often cut out to be sold to manufacturers of isinglass.

At the home port the fish are packed in hogsheads of strong brine. After being thoroughly soaked here they are spread on flakes — light platforms of lattice work — to be dried (Fig. 21). By this salt-drying process two-thirds of the water is removed from the fish flesh and its preservation is insured. Many of the dried cod are sent away whole, but the business of preparing boneless cod has become a very important one at the fishing ports, especially at Gloucester. For this purpose the skin and bones are removed from the fish and the flesh is then cut into short pieces or torn into fine shreds by machinery. Boxes of boneless cod may be seen at any grocery.

Most halibut are sold fresh, but some are salted on board the schooners. The salted halibut is made into smoked halibut by being hung for several days in smoke houses exposed to the smoke from fires of oak chips. Haddock are also smoked and sold under the Scotch name of finnan haddie.

Although the food on fishing schooners is abundant, varied, and well cooked, and the home life of American fishermen shares the usual comforts, a fisherman's life at sea is hard and dangerous. There he must rise early and work late and omit the Sunday rest. The light dories must often be forced against the wind when tending trawls, and must be very carefully managed in high seas. The hooks must be baited with bare hands even in icy weather. On the shoal water of the banks the waves run high during fall and winter storms,

and in some years many schooners are lost. Not uncommonly a schooner returns with flag at half mast for some of the crew swept overboard, or lost while out in the dories. While tending trawls a dory may be overwhelmed by a sudden squall, or during a fog the men may lose their bearings and drift away from the schooner and the sound of its horn.

FIG. 23.
A fishing schooner.

The Gloucester fishermen do not work for wages, but the profits of a voyage are divided among the owners, captain, and crew, a small portion being set aside for the fund that provides for the widows and orphans of fishermen of that city.

Mackerel Fishing. — Minute animals in the surface waters of the ocean serve as food for many fish, such as mackerel, herring, and menhaden. These in turn are pursued by larger fish, among which the swordfish and bluefish are most valuable for market. The mackerel disappear in winter, but come shoreward as the surface waters get warmer. Since many thousands move together in *schools*, a lookout on the mackerel schooners easily sees them as they swim along near the surface.

When a good school is sighted, the crew leap into the great seine boats, leaving the schooner to the cook, and pull away. The captain notes the direction and speed of the school, and so plans that the net is cast in a great bend in front of the mackerel, and is closed behind them as they enter. The upper side of the net is supported by cork floats, the other stretched downward by lead weights. Since it is at first open below, the school may sink and escape; but all hands straining at each end of a rope passed through pulleys along the lower edge of the net, quickly pull it together into a great pocket and the

mackerel are entrapped. The schooner is then brought alongside, and the fish are hauled on board by a dip net. The greater number of mackerel are salted in brine, although many are carried to port as fresh mackerel.

There are other fisheries of local importance, which are considered under the separate states (pp. 73, 80, 86, and 113).

FIG. 24.

The forested upland of Maine. Mt. Katahdin.

Lumbering. *Forest Products.* — The forests, as well as the fisheries, were of value to the settlers in many ways; for instance, for lumber, wood ashes, and timber for ships. Many lofty veteran pines, clear, straight, and evenly tapering, were marked by the king's broad arrow and reserved for masts for the English navy. There were stirring

times when long teams of oxen hauled one, by dint of much shouting by many drivers, down to a seaport.

Much of the land is now cleared, and over the southern uplands only isolated tracts of woodland occur, which are of value mainly in supplying firewood. But in the north there is still a vast forest stretching eastward from the White Mountains (Fig. 50) and covering half of Maine. In this forest both Connecticut and Rhode Island might be placed and lost from the world and each other.

Many kinds of valuable trees abound. There are poplar, birch, maple, beech, and other deciduous trees, and such evergreens as spruce, hemlock, and pine, with cedar in the swampy lands. Spruce is abundant over an upland area in Maine that is larger than all Massachusetts, and may long remain a source of great revenue if, in cutting, care is used to avoid waste and to protect young growth. The yearly cut of spruce yields a value of eighteen million dollars' worth of paper and six million dollars' worth of lumber.

Logging. — Before the Civil War, logging commenced only after the first snowfall, when the supplies could be drawn in on sleds across the frozen swamps. In those days also the pine logs were dragged to the river landings by slow ox teams. To-day the cutting commences in late summer, that the logs may be ready to be moved when the snow comes. Roadways are cleared, and the logs are hauled by horses to great piles in the "yards." When the chopping is over, in January, the logs are taken onto the ice of the lakes, or to the landings, whence they are rolled into the river when the ice breaks up. Food supplies for the next season are then brought in.

The beans and salt pork baked in the ground, and bread baked before an open fire, which were the food for the lumbermen in past days, are now supplemented by a more varied fare

cooked on ranges. The great log camps, however, with their rough bunks of boughs, still house the "gang" of perhaps fifty men. The life is hard and wearing, but the evenings are often made gay by songs and games.

Driving. — Driving, or floating the logs down stream on the spring floods, is less dangerous than formerly, being in charge of special companies on the large rivers. They have cleared away many of the boulders and sandbars against which the logs were often piled in jams, and have built dams to hold the water back for use when necessary to float the logs. A driving gang of a hundred men accompanies the logs, which enter the main stream from many lakes and tributaries. When necessary, the men leap from one rolling log to another, freeing them from jams in the quick water of rapids and pushing them onward in dead water where the current is slow. At last the logs are caught by the "booms," which are lines of logs fastened together and stretched across the rivers above the mills. Every log is marked so that those of the different owners may be separated. The several lots are distributed to the mills of different towns and cities below.

Lumber. — The largest sawmills are located at falls near tidewater. Why? But some which are placed beside the lumber wharves, now use steam, produced by burning sawdust. Many people are employed in manufacturing and shipping lumber, and the industry has occasioned the growth of towns and cities along the rivers of Maine; such for instance, as BANGOR, the most important lumber market in the Eastern States. While formerly the product was mainly boards, timber, clapboards, and shingles, to-day a great variety of products is manufactured, such as sashes, doors, blinds, boxes, finish, mouldings, flooring, and hardwood articles of many kinds (pp. 98, 107, and 108).

The machinery for handling the logs is greatly improved, and many devices now replace hand labor. The logs pass

from the river to the swift carriages of the bandsaws, which give a continuous cut and rapidly change logs to lumber. The boards pass to edgers and planers, then over whirling rolls to their places in the yards. The slabs are cut into laths, pickets, etc., and what remains is sold for kindling or made into wood pulp.

Much lumber is shipped in coasting schooners to Boston, New York, and other ports ; but a part of the product goes by rail from inland mills, and a smaller portion is sent to foreign ports in steamers.

Wood Pulp and Paper. — With the closing decades of the last century there grew a demand for more and cheaper paper than rags alone could provide, and a new use was found for forest trees. Paper was made from poplar wood, and then spruce proved better still. On the one hand, this increases the demand on the forests, and takes even the small trees ; on the other hand, crooked and seamy logs, which the lumbermen formerly left as waste, may be used for paper. The paper companies have bought large areas, where, with wise and careful cutting, the spruce may grow as fast as used.

In making wood pulp, small logs are cut into short lengths and the bark is removed by a machine. Then they are placed within the iron enclosure of a grinder and pressed hard against a revolving sandstone wheel. From this the ground-up pulp is carried off in water, and strained through sieves placed in large tanks. Thence the very thin pulp is pumped to the paper machines. In these the pulp is taken up in a thin and even layer on a broad belt of cloth which passes into and then out of the pulpy water. The water drains away slowly, and as the cloth passes between two large rolls the sheet of fibre adheres to the upper roll. As soon as a thick enough layer has collected, it is cut, stripped from the roll, and folded like so much damp blotting paper.

FIG. 25.

A grinding room in the great paper mill, Millinockett, Maine.

For making stronger and whiter paper, chemical fibre is added to the wood pulp. For making this fibre the wood is cut into very small chips and cooked for several hours in hot, acid liquor under steam pressure, until the fibre is fully separated and the pitch dissolved. Having been drained and washed, this fibre is also passed through a paper machine, so that it is easily handled and shipped.

Newspaper stock is usually made from wood pulp. For book and magazine paper much chemical fibre is added to the wood pulp, the two being well mixed in water and again passed through a paper machine of many rolls.

The paper industry is an important one in northern New England. Sawmills run only about half the year, while the pulp and paper mills employ more workmen and keep them ever busy. The mills are all on the large rivers, where the logs are floated down to them, and where cheap power to run the grinders is available at the falls. Many cities and towns on the Penobscot, Kennebec, and Androscoggin in Maine have large pulp and paper mills (pp. 108 and 112). By the development of this industry, BERLIN, on the falls of the Androscoggin in New Hampshire, became a city in a few years.

Agriculture. *Development.*— Agriculture was for two centuries the leading occupation of New England, for the other industries were carried on only at odd times by those who were engaged in farming during much of the year. This same condition exists to-day in a number of places. For example, lime casks are made by farmers who live in towns near ROCKLAND, Maine, where much lime is produced (p. 115); and salmon are caught in weirs by those whose farms border the lower Penobscot. Nevertheless, although the soil of most of the newly cleared land was so rich with leaf mould as to give the pioneers good grain crops, the uplands are too rocky and uneven to be tilled easily with machines. Therefore New England now depends upon the Central States for food staples.

With the growth of cities and railways New England farms have greatly changed. Formerly their products were so varied as to meet most of the needs of their owners, and some farmers still keep a half dozen kinds of farm animals and cultivate small areas of many orchard, field, and garden crops. In common with the tendency in all industries, however, a progressive farmer to-day gives his main attention to some one class of products. For example, there are stock farms which rear thoroughbred cattle or horses, and poultry farms that produce eggs and chickens for market. In Aroostook County, Maine, thousands of acres of potatoes are planted (p. 110). In early fall many people on Cape Cod are busy picking cranberries, cultivated in the bogs that have formed in depressions of the glacial sands. On the terraces of the Connecticut valley there are fields of tobacco (p. 83). Near the cities there are many hothouses for raising flowers, to meet the increasing demands of wealth and culture.

The ready market in the cities for milk, fresh vegetables, and fruit has given the dairy and market-garden industries the leading place in New England farming. Like all well-watered, hilly districts, our uplands are grass grown and fitted for dairy farms. Market gardening does not require extensive areas, and brings returns so large as to warrant thorough cultivation of the soil, even though it be light and loose.

FIG. 26.

A poultry farm.

Dairying. — In early days the cows were milked only when out at pasture, and they simply lived through the winter with but scanty food. They were of no certain breed, and were as highly valued for meat as for milk. Only half a century ago drovers travelled through New England buying cows and oxen, and drove them in herds to Boston, there to be killed for market.

To-day the dairy cow (Fig. 27) is a milk machine, as highly developed a product of human skill as a loom. Cows have been imported from parts of Europe, where they have long been carefully bred, and the breeding of stock has been continued here so as to secure animals that should turn their food into a large yield of rich milk, instead of placing it in flesh and fat upon their bodies (p. 100). The herds of Jerseys, Holsteins, and other breeds supply milk throughout the year, for in winter they are housed in good barns and provided with varied and nourishing foods.

FIG. 27.
Stoke Pogis Regina, — a valuable Vermont Jersey cow.

Largely because of the dairy business hay is far the most important crop raised on New England farms. The land is manured yearly, and every few years it is ploughed and sown with grass seed. Besides well-cured hay, — and more concentrated foods from corn, oats, and cotton seed, — green food or ensilage is fed. For this the green corn stalks and ears are cut up into bits which are packed closely within the walls of a silo away from the air. Although some fermentation takes place, the ensilage retains the food value of the corn and is liked by the cows.

Many farmers near the large towns and cities make a business of selling milk. In the evening the milk from

several farms is collected, poured into a large mixer, and then put into cans and glass bottles. Early the following morning the milk is delivered to the customers in the city.

Boston requires so much milk that its supply must be brought from a distance by train. Four large firms, which contract with the farmers for milk, run trains from southern New Hampshire and central Massachusetts. Milk delivered in the morning at the railway station reaches the contractors at noon, and is sold from their depots to the milkmen, who deliver it the next day. This milk, although a day or more old when delivered, has been kept sweet on ice. Inspectors acting under a state law see that it is not weak or adulterated. When too much milk is received, the contractors make the surplus into butter. Cream is also sold, and much of this comes from creameries in Maine. A milk train from Pittsfield takes milk from many towns to New York City daily.

At a distance from populous districts, most of the milk is used in the manufacture of butter and cheese, which may be transported long distances with profit. Creameries and cheese factories are more abundant in Vermont (p. 102) than elsewhere in New England.

Market Gardens. — When truck farmers in the Southern States commenced to send their products north, the raising of vegetables near the northern cities developed into a special industry to meet this competition. The work of the market gardener continues through all seasons. The large growers have glass houses, heated by steam or hot water, in which cucumbers, lettuce, and radishes are raised in the winter, and tomatoes in the spring. The hothouses near Boston are very extensive (p. 69), and their produce finds sale even in New York.

After the last fall crops have been gathered, long trenches are dug on some sunny slope and filled with deep beds of fresh

manure covered with several inches of loam. These are protected from north winds by a high board fence; while sashes of glass, thick mats, and board shutters, resting one above the other, protect the beds from the cold air. The decomposition of the manure produces heat, and the seeds sown in the loam germinate. On sunny days the mats and shutters are taken from the glass. Radishes, dandelions, and cucumbers are raised in hotbeds in spring, and many kinds of plants are started in them to be later transplanted.

Several crops a year are often raised from a field. The land is ploughed, manured, ploughed again, harrowed, and raked before each crop, thus giving little chance for weeds. Planting, cultivating, weeding, watering, and gathering the crops give employment to many hands throughout the summer. The products are taken to the cities and, like milk, are sold to large firms or directly to customers.

Crops that require little skill are commonly grown by the farmers throughout New England. Potatoes and cabbages are illustrations. In Maine much sweet corn is raised for the canning factories scattered through the towns (p. 112). In addition to the common vegetables, the market gardens raise celery, green peas, cauliflower, and other products which require trained care while growing, or which must be marketed at once when mature. Celery, onions, and such root crops as turnips and parsnips are stored in cemented cellars for sale in winter after the surplus from the farms has been marketed and the prices are higher. The market gardeners also raise strawberries, raspberries, blackberries, and other small fruits. Some places have large orchards of peaches and pears, and apples are extensively grown. Maine exports many apples.

Because the very best fruit and vegetables secure a ready market at high prices there are special seed farms. The owners grow seed carefully for sale, and strive to

develop varieties that shall mature early or late, and yield fairer, larger, and better keeping products (p. 83).

Quarrying. — New England is an old, deeply worn mountain land, whose weathered surface rock has been rasped away by the glacier that once covered it. The many exposed ledges of hard rock hinder farming, but supply valuable building and road-making material. The growth of cities has increased the demand for stone, and quarrying has become an important industry. Some kinds of stone deserve special mention. Sandstones are quarried in the Connecticut lowland. The marble quarries about RUTLAND, Vermont, are the most important in the country (p. 104). An abundance of lime of the best quality is burned in and near ROCKLAND, Maine (p. 114). Granite, however, is quarried in each state extensively.

Granite. — Granite forms the main mass of many New England mountains, because of its strength, hardness, and resistance to weathering. The same qualities make it valuable both for building stone and street-paving blocks. The varying colors of different granites and the enduring beauty of their polished surfaces have led to the use of the stone in the interior of buildings and for monuments in cemeteries, although it is not so easily and cheaply worked as marble or slate (p. 108).

Granite is so hard that it must be fashioned for use largely by means of the chisel and hammer. The granite blocks are separated by blasting or by wedges driven into holes made by drills. These great blocks are further divided into desired sizes in the latter way and are placed by derricks on platform cars for removal. The granite slabs are split and trimmed to the size for paving blocks by the skilful use of hammers; but for shaping blocks for buildings and monuments the use

of chisel and hammer is now supplemented by a power drill. This is held and directed by the hand, and strikes swift blows against the stone by the force of compressed air.

The drowning of the coast has brought granite ledges next to the water in many places, as on the Maine coast (p. 114) and at Cape Ann. From such places paving blocks and building stone may be cheaply conveyed in vessels to the great coast cities. Granite is also quarried at many inland points, as near CONCORD, New Hampshire (p. 98). The granites of QUINCY, Massachusetts, and WESTERLY, Rhode Island, have long been quarried. Recently the quarries about BARRE, Vermont, have been developed rapidly, until now the granite business is of immense importance there (p. 105).

Textile Manufactures. *Development.* — Fish and lumber were the basis for a commerce that enriched the coast towns of New England and supplied them with foreign manufactures; but agriculture yielded no staple product so freely that much of it could be sold abroad. The cold winters required warm clothing, however, and gave leisure for its manufacture; so the farmers raised flax and kept flocks of sheep to provide materials for their "linsey-woolsey" suits. The sheep were washed and their fleeces sheared by the men, while the women prepared the tangled wool for spinning by combing it with hand cards, which were rude brushes with wire teeth.

Perhaps you have seen an old spinning-wheel by whose swiftly turning spindle much fibre has been twisted into yarn, or spun, as the wool was slowly drawn out to the right size between thumb and finger. During the long winter evenings the homespun cloth was woven on rude hand looms. This was then "fulled," that is, soaped and worked with the hands

until the fibres were loosened and matted together, making the cloth thick and warm.

There was never cloth enough made in the colonies to supply their needs, although laws were enacted to encourage its manufacture. Sheep were free from taxation; bounties were given for wolves killed; and the dog tax that we still pay was imposed then, because dogs often killed sheep. The colonies required that children should be taught to spin, and that each family should spin its yearly share of yarn.

FIG. 28.

A spinning room in a textile factory.

In the second century of colonial times, mills where the farmers could have their wool carded and their cloth fulled became common. A few still remain in remote districts of northern New England. There were skilled weavers in some villages, who wove cloth to order from yarn supplied them, while others went from house to house plying their trade.

Although the Revolution removed the restrictions imposed by England on the manufacture of cloth for sale, the industry developed very slowly. In the latter part of the eighteenth century many inventions were made in England whereby cotton or wool could be cheaply and rapidly spun on machines bearing many spindles and driven by water power. Soon power looms replaced hand looms. As English law strictly forbade

the exportation of textile machinery, or any drawings or descriptions of the machines, the small American factories that were started could not make cloth as cheaply as it was imported. However, eager to profit by the opportunity, several skilful English mechanics came to this country near the opening of the last century and built spinning and weaving machines like those familiar to them. The War of 1812 followed, and prevented the importation of cloth, and this encouraged many factories to start. Later the tariff protected

FIG. 29.

Manville, a factory village of Rhode Island. What does the picture show?

American factories from English competition. Since then, American invention has so improved textile machinery that in some lines it is superior to foreign patterns, and American cloths are sold in the markets of the world.

Cotton Manufacturing. — Cotton manufacturing was never a household industry in New England, since little cotton was produced in America before the invention of the cotton gin in 1793. Its successful manufacture here dates from the coming of Samuel Slater from England in 1790. With the aid of PAWTUCKET capitalists he made machinery and started successful mills in Rhode Island.

Young men who had been trained with him established mills of their own at the many falls of the Blackstone, Pawtuxet, and Quinebaug rivers (pp. 79 and 90). They started with small mills, and gave close attention to the work, so that fine grades of yarn were produced and some mills made a specialty of certain kinds of cloth. These characteristics are still true of that section (Fig. 29).

When the War of 1812 checked commerce, Boston merchants invested their money in manufacturing. A mill at WALTHAM proved successful, and later, Boston capital built dams and mills at LOWELL, MANCHESTER, LAWRENCE, NASHUA, BIDDEFORD, and LEWISTON. To secure operatives for the large mills erected, the corporations built boarding houses and placed them in charge of worthy people so that parents in country towns might safely allow their daughters to enter the mills. Excellent hands were thus obtained, and although the hours of work were long, the operatives were treated considerately and well paid. Since then conditions have changed. Immigrants have largely replaced native workmen, and both parents and their older children are now employed in the mills (p. 29). State

FIG. 30.

Relative importance of cities and water-powers in cotton manufacturing.

laws have shortened the hours of labor and have protected the interests of the employees in other ways.

FALL RIVER, the "Cotton City" of America, is an illustration of cities where local capital has developed the industry. The water from ponds on the upland rim of the Narragansett Basin here descends in falls to tide level, and cotton mills were built early in the last century. The moist climate, due to the neighboring ocean, favored cotton spinning. The money gained in the first mills was invested in others driven by steam power, and Fall River became the leading cotton-manufacturing city of the country. The corporations erected tenements rather than boarding houses, and the operatives have from the first been a somewhat permanent class. Cotton manufacture in NEW BEDFORD and TAUNTON has had a similar history. ADAMS and NORTH ADAMS form an inland centre of independent development where cotton mills have multiplied.

Plain sheetings and shirtings have always been the most common product of the mills, although nearly as much print cloth is woven. This print cloth, for calico, is printed in colors with engraved rolls, somewhat as paper is printed by a rotary printing press. For other goods, such as ginghams, the yarn is dyed, and is then woven in stripes or checks. With the growth of cotton mills through the Southern States, where the coarser yarns and cloth are produced near the cotton fields, New England manufacturers began to turn their attention more and more to the finer grades of cloth and to the mixtures of cotton with wool or silk which were formerly imported. In order that this industry may be further improved, textile schools, which thoroughly train young men in all its branches, have been established by the aid of the state of Massachusetts at LOWELL, NEW BEDFORD, and FALL RIVER.

Sharp competition has compelled constant effort to cheapen the cost of manufacture, for every mill has striven to undersell

others and thus to secure a larger market. Sometimes this has led to the reduction of wages, and then strikes, disastrous both to owners and operatives, have followed. With the progress of invention it has been necessary, even at great cost, to discard old machines for swifter and better ones, for without the best machinery a mill cannot compete in production. Thus small mills have given way to larger mills because in the larger mills cloth is made more economically. There are now fewer cotton mills than a half century ago, yet more cotton cloth is produced.

Woollen Manufacturing. — Woollen mills are smaller than cotton mills and more widely scattered, many being in towns along the smaller rivers. This is natural, since they were developed from the many fulling and carding mills that added machines for spinning and weaving (p. 50). At the time when communication was difficult, the abundant small water powers were of much value for supplying local needs. Berkshire, where many sheep were formerly raised, was then the leading county of Massachusetts for woollen factories. PITTSFIELD is still a centre for woollens.

After a tariff was placed on worsted cloth, during the Civil War, its manufacture developed in America. Like cotton manufacturing, it is centred in the large mills of cities, because when first started it was necessary to import complicated and costly machinery and to bring skilled workmen from abroad. The mills of PROVIDENCE lead in worsted manufacture; but worsted goods are produced extensively in LAWRENCE, LOWELL, MANCHESTER, WOONSOCKET, and FITCHBURG. Their manufacture is being started in smaller places since worsted machinery is now made in Lowell.

After the wool has been carefully sorted into different grades, it is washed and passed through the bur picker, whence

it is blown as light flecks of clean fibre, ready for bleaching and dyeing. If intended for woollen cloth, the wool is passed through three carding machines, and is then spun into a loose, weak, fuzzy yarn of tangled fibres. Cloth is loosely woven from this, and fulled to close the meshes. For worsted cloth the wool is of a grade which does not need cleaning in a bur picker. A delicate machine called a comb removes all short fibre, and lays the long fibres parallel. Then a strong, closely twisted, smooth, hard yarn is spun, and this is closely woven into a cloth with a hard surface that needs no fulling.

In America textile mills have usually performed all the many processes necessary to change the cotton and wool to cloth ready for use. In England separate mills do the spinning, weaving, dyeing, and finishing, for the reason that each process was a separate trade before factories were built. This system has also been adopted in New England to some extent. Thus, there are mills which spin yarn for sale to mills that do not produce enough for their own looms; and while some cotton mills finish their own cloth, others send their sheetings to bleacheries. In a few textile cities there are mills which do nothing but dye, print, or finish cloth for others.

The manufacture of woollen carpets is important in America, where the prosperity of the people causes a large demand for floor coverings. Although the mills of New England manufacture but a fifth of the carpets made in the United States, and the great centre of carpet weaving is at Philadelphia, carpet looms which have proved the best in the world were invented in Massachusetts. The carpet mill at CLINTON is the largest in the world, and there are other large mills located at LOWELL, at BOSTON, at WORCESTER, and at Thompsonville, a village north of Hartford. These mills produce most of the more costly carpets made in the country, such as Axminsters and Wiltons, also tapestry Brussels.

There are many lesser phases of textile manufactures. The difficult task of making strong cotton thread for sewing machines was first accomplished in America at WILLIMANTIC. Now well-known brands are also made at HOLYOKE, where the great water power (Fig. 14) is used both by cotton and woollen mills. Although flax is no longer grown in New England, it is imported for a few mills that make linen shoe thread and twines, or that weave towels and other coarse linens. Many

FIG. 31.

Looms, the Arlington Mills, Methuen, Mass.

mills in New England are engaged in the knitting of underwear, hosiery, and gloves. Some are in the Merrimac valley, from LOWELL north to LACONIA. American silk manufacture (p. 91) centres at Paterson, New Jersey, but much silk cloth is also woven at the large mills in SOUTH MANCHESTER, near Hartford. The greater part of the American sewing and machine silk, and floss and embroidery silks is made in New England, the largest mills being at NORTHAMPTON.

Shoe Manufacture. *Leather.* — There were tanners and shoemakers among the early colonists. In nearly every town there was once a tannery, where the hides taken from the cattle killed for food were converted into leather. The hides lay for months in the tan vats, soaking in water which was full of tannin obtained from hemlock bark. This changed the hides to tough leather which would not decay. When soft leather was needed, the thinner hides were also oiled and worked until pliable (Fig. 32).

Since it is cheaper to take the hides to the forests than to transport the bark, the New England tanneries of sole leather are now among the hemlock forests of eastern Maine. Much sole leather is tanned in the Central States with oak bark. Light upper leather, which requires less tannin in its manufacture but more skill, is made near the leather market of Boston, at PEABODY, SALEM, LYNN, and WOBURN. In place of tannic acid from bark, chemical baths are now used to tan morocco and similar leathers.

Development. — When not busy with farm work, the early shoemakers made shoes for their neighbors, or went from house to house plying their craft. Seated on a low bench, the lone workman cut, sewed, and hammered with rude tools like those used a thousand years before in Europe. Pieces of thin leather were cut out and sewed together to form the upper; this was turned inside out, fitted over the wooden last, or model of the foot, and tacked to the thick sole. The shoe was held on the knee by a strap passing under the foot while the upper and sole were sewed together. An awl was used to make a path through the pieces of stout leather for the slender needles. The shoe was turned right side out when sewed, again placed on the last, and, while held on the lapstone, pieces of heavy leather were tacked or pegged to the sole to form the tap and heel. Paste was used to attach a smooth inner sole, and blacking served to color the edges, which were then polished.

The steps in the process of shoemaking are much the same to-day, but there has been a wonderful change in the tools used. Once a pair of shoes was a day's work; now they may be made in twenty minutes or less.

Shoes were made near Boston in early colonial times, and the success of the industry led expert shoemakers to come from England. Some who were skilled in making ladies' shoes settled at Lynn; others established the making of

FIG. 32.
A tannery at Lowell. Glazing calfskins.

men's shoes in towns south of Boston. Each section has ever since maintained its specialty. Master shoemakers had tiny shops where two or three workmen aided them in making up lots of shoes, which were afterwards carried to Boston for sale. At a somewhat later time it was the custom to fit up large central rooms for cutting the leather into all the necessary parts for shoes. These were then made into bundles which were given out to surrounding shops, or sent to the country towns of eastern Massachusetts, and even into Maine. In the homes the uppers were sewed by women and the heavy work on the soles was done by men. The finished shoes were then

returned to the cutting rooms ready for sale. This system lasted until about 1860, and in the making of hand-sewed shoes it is still preserved in a measure.

The workmen in these shops were of marked intelligence, and work was often accompanied by the reading aloud of the newspaper and the discussion of political issues. Shoemaking was confined to native workmen much longer than other manufacturing industries.

When the sewing machine was invented, the stitching of the uppers was transferred to the same building as the cutting room. Then came a machine which could sew on the sole, and the shoe factory replaced the little shoe shops. Machines have been added to perform every step of the work, excepting the cutting of the parts of the upper, where expert judgment is needed to cut the leather to the best advantage. American men and machines make better and cheaper shoes than are made in other countries, and American shoes and shoe machinery are now exported.

Distribution. — The early factories were small and some were scattered through the districts where shoes had been made under the old system. When strikes resulting from the introduction of new machinery or from questions of wages became frequent at the centres of shoe manufacturing, some manufacturers removed to country towns (p. 95) in the hope of avoiding labor troubles.

To-day the tendency is to close the small and scattered factories, and to concentrate the business in large plants in the leading shoe cities. Although there are shoe factories in some one hundred and fifty towns of Massachusetts, New Hampshire, and Maine, and a few in each of the other New England States, two-thirds of the production comes from the cities of LYNN, BROCKTON, and HAVERHILL, and the cities and towns near them. Many large firms make special shoes which they widely advertise.

Since the discovery by Goodyear that rubber may be vulcanized, — that is, heated in combination with sulphur so as to remain hard and durable in use, — it has been made into a variety of articles and fabrics in New England factories. Many rubber overshoes and boots are made in southern New England; for instance, at MALDEN and CHELSEA, near Boston.

Manufactures of Metals. *Development.* — It is a surprising fact that Massachusetts was for a hundred years the chief seat of American iron manufacture, and mined its own ores. The water soaking through the glacial soil dissolved much iron, and this collected in rusty deposits in many springs, ponds, and swamps. In many sections this inferior bog iron ore may still be dug from swamps or dredged from the pond bottoms. Groups of farmers established rude forges where the ore was melted with charcoal fires, and either cast into such articles as kettles and cannon, or roughly hammered into bar iron. In many a farmer's chimney corner was a little forge which was kept busy during the evenings while father and sons hammered out nails from bar iron.

During the second century of colonization richer ores were opened up in western Massachusetts and Connecticut, and pig iron, good enough to be used for edged tools, was produced in furnaces. Though the iron for the *Monitor* came from near Mt. Greylock in Massachusetts, the development of richer mines in Pennsylvania and the West long ago led to the closing of most of the iron mines in New England (p. 88). Mills for rolling iron bars and plates from pig iron have also failed in competition with mills nearer the mines of Pennsylvania.

Distribution. — New England still has extensive manufactures of metals, and these are in part outgrowths of the

early industry. For instance, iron ore was formerly mined at Brandon, Vermont, and the casting of car wheels has been continued at RUTLAND, although the pig iron now comes from outside the state. While most nails are now made near the iron mines, over half the tacks of the country are still manufactured at TAUNTON and thereabouts. Stove foundries were early established to meet a need of the climate, and they still flourish.

In general, New England iron and steel manufactures are such as require little metal, but much skilled labor and exact machinery. Fine tools of the best quality and finish are made in many places. The largest screw factory in the world is in PROVIDENCE. There is a great wire mill in WORCESTER. In the factories of many Connecticut cities and towns small articles in hardware for buildings, carriages, and other uses are produced (p. 84). Much electrical machinery is made in LYNN. There are great scale works at ST. JOHNSBURY and at RUTLAND in Vermont.

Brass work of all kinds is made in the cities of western Connecticut, notably at WATERBURY (p. 89). The extensive manufacture of jewellery and silverware, especially in and near PROVIDENCE, has developed from the early invention and application there of a method of gold plating. Yankee ingenuity constructed wooden clocks in colonial times, and now American-made watches, from WALTHAM, WATERBURY, and elsewhere, have won world-wide fame both for cheapness and for value as time-keepers.

Machinery. — Machinery is the most important of the New England manufactures of metals, and machine shops are to be found in every manufacturing city. Because the manufacture of textiles, shoes, paper, and other goods developed here, machine shops where the ideas of the

inventors took form are also found. For instance, the best of textile looms are of New England invention, and there are great loom works at WORCESTER. In fact, this city, so centrally located, is a great machine shop for supplying the needs of the cities round about. In general, the larger the city, the more machinery made there; hence the factories of Boston naturally produce the most.

FIG. 33.

A machine shop. Making shuttles for sewing machines.

Vehicles of all kinds are made in New England. The coaches and wagons of CONCORD, New Hampshire, were famous long ago; and the carriages of AMESBURY, Massachusetts, are also widely known. Bicycles are manufactured at many points, notably at CHICOPEE and HARTFORD. Factories for motor carriages are multiplying now. The workshops of the railway systems form great industrial plants in some cities (p. 85); and in PROVIDENCE and TAUNTON there are important locomotive works.

Commerce. *Trade Centres.* — Most New England villages are trading points for the surrounding farmers. Every country store purchases eggs and butter, and in return sells groceries, dry goods, tools and other wares. The cities are centres of trade for still larger districts. Instead of one little store there are many large ones, each keeping a full assortment of goods in some one line. The stores of the larger cities bear the same trade relation to the nearby towns that the traders in the villages bear to the surrounding country. Wholesale stores and agents in the large cities receive the surplus of the farms, goods from the factories, and many products from outside of New England, and distribute them to retail stores in the towns. Some large ports receive raw materials — such as fibres, rubber, and dyestuffs — for the factories situated inland, and send away manufactured products from these factories. These ports are therefore great trade centres.

Boston. — Boston is the greatest centre for New England commerce. It is connected by steamship lines with European ports, with most Atlantic ports of North America, and with the West Indies. The location of Boston on a harbor at the most westerly point of the coast north of Cape Cod, and so centrally situated that railway lines were readily built so as to radiate to all the great mill cities, has enabled its merchants to make it the second seaport of the United States.

As a wool market Boston is surpassed by London alone. The costly stocks of wool kept in the city offer so wide a range of choice that they attract buyers regularly from Philadelphia and from mills elsewhere in the country. The offices of more than a hundred firms engaged in the sale of wool are found grouped near the Southern Union

Station. A few steps away, in great warehouses along the water front, are stored bales of wool from the Western and Southern States, from Australia, and in fact from all the world. Here the would-be purchaser may select wool of just the quality he needs.

Boston imports more Egyptian and Peruvian cotton than any other American port, and it also exports much American cotton. Brokers have agents in the Southern States buying up cotton, which is sold in Boston from samples, and then shipped directly to the mill from the cotton gins. The banks loan the money to purchase the cotton, and later receive their money, with interest, when the mills have made the fibre into cloth.

Boston, therefore, is a great financial centre, not only investing capital to establish mills, but also supplying that which is needed for their transactions. There is a United States sub-treasury in the city, which acts as an agency of the national government in its financial dealings with the people of New England. Near the sub-treasury are many national banks, where the working capital of merchants is deposited. The merchants pay for their goods by bank checks, which may be cashed at banks throughout the cities and towns of New England. In the same portion of the city is the Boston Stock Exchange, whose members act as agents for people who wish to invest money in the stocks and bonds of the many corporations. All the great insurance companies of the world have offices or agencies in Boston.

Boston is the greatest American market for leather and leather goods (p. 57). Leather is shipped there from tanneries all over the country and a part of it is sold to factories outside of New England. Some of the shoes made from this leather return to Boston for sale; in fact, many shoe factories have Boston offices where their sam-

FIG. 34.

View from Stock Exchange building, Boston. Note the State House dome at the left, and the old State House in the foreground.

ples are displayed for examination by purchasing agents, who come here from cities all over the country.

Most of the textile mills, machine shops, and other New England factories also have offices in Boston for the sale of their products. The business centre for southwestern New England is New York City, though many large corporations have offices in both cities.

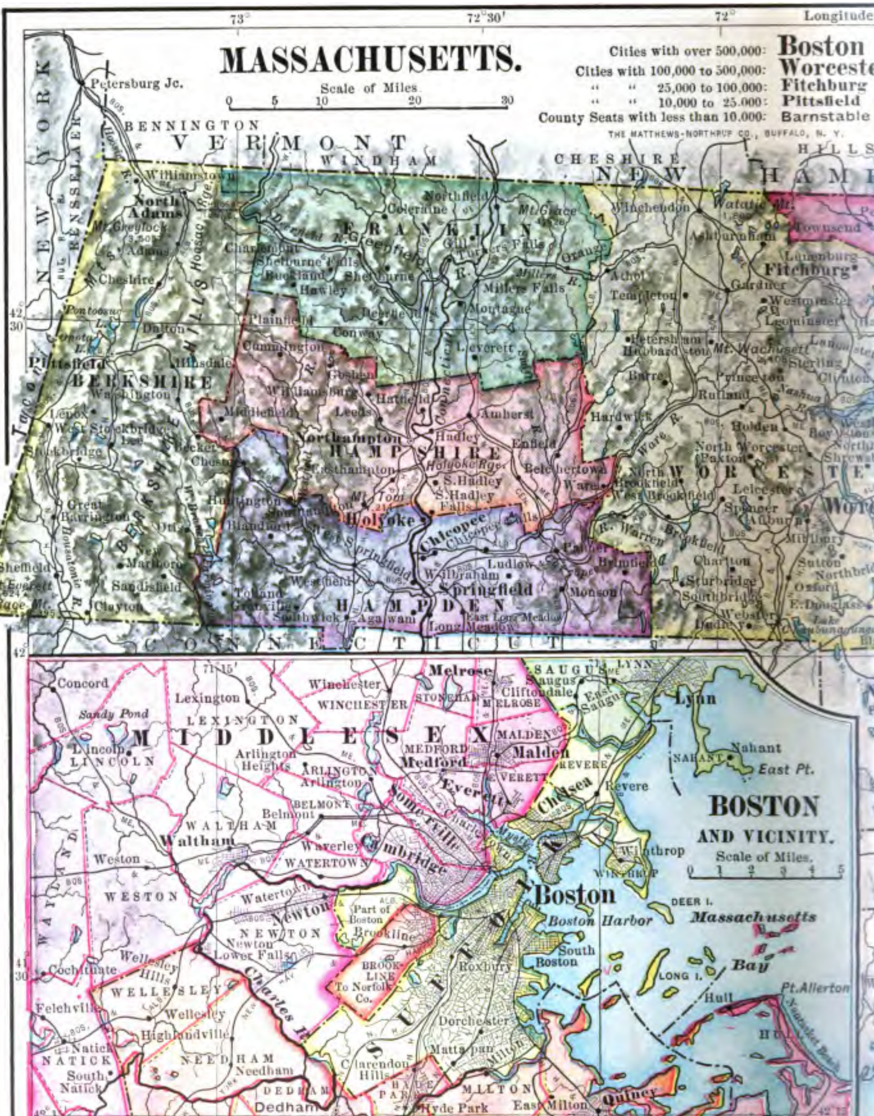
Populous commercial cities are the seats of many and varied manufacturing plants because of the abundance of materials and labor, and the ready market. Boston leads

other New England cities in some lines of manufacture. It leads, for example, in the manufacture of clothing and also in the publishing and printing of books and periodicals. In fact, the goods manufactured in Boston far exceed in value those of any other New England city. Furthermore, while every growing city employs men of many trades in erecting buildings, — architects, contractors, and firms which supply building materials are especially numerous in the larger cities, like Boston, where contracts for work all over New England are awarded.

Large cities are also seats for the preparation of food products for shipment and sale. This is well illustrated in Boston and surrounding towns. Coffee, imported at Boston, is roasted and ground there; spices are ground and packed. Sugar is refined; chocolate is manufactured; and candies are made from both substances. Although cattle are slaughtered in western cities, and the dressed beef shipped to many distributing centres in New England, trainloads of hogs come to large pork-packing houses in CAMBRIDGE and SOMERVILLE, near Boston, there to be killed and dressed for the New England market.

MASSACHUSETTS

The "Bay State" contains half the population of New England, although comprising but an eighth of the area of the section. Of the fourteen cities of New England having more than sixty thousand inhabitants ten are in Massachusetts. Which are they (p. 124)? Nine of these largest cities and most of the people are in the eastern part of the state which belongs to the Piedmont belt. In fact, nearly half the population, that is one-fourth of all


MASSACHUSETTS.
Scale of Miles
0 5 10 20 30
Cities with over 500,000: Boston
Cities with 100,000 to 500,000: Worceste
" " 25,000 to 100,000: Fitchburg
" " 10,000 to 25,000: Pittsfield
County Seats with less than 10,000: Barnstable
THE MATTHEWS-NORTHRUP CO., BUFFALO, N. Y.
73°
72°30'
72°
Longitude
NEW YORK
RENSSELAER
VERMONT
BENNINGTON
WINDHAM
CHESHIRE
NEW HAMP
CONNECTICUT
Petersburg Jc.
Williamstown
North Adams
Adams
Cheshire
Dalton
Pittsfield
BERKSHIRE
Hinsdale
Washington
Lenox
West Stockbridge
Stockbridge
Lee
Becket
Great Barrington
Otis
New Marlboro
Sheffield
Sandisfield
Clayton
FRANKLIN
Colerain
Northfield
Greenfield
Shelburne Falls
Buckland
Shelburne
Hawley
Charlemont
Conway
Deerfield
Montague
Millers Falls
Turners Falls
Orange
Leverett
Plainfield
Cummington
Goshen
Williamsburg
Hatfield
Leeds
Middlefield
Amherst
Northampton
HAMPSHIRE
Hadley
Easthampton
S. Hadley
S. Hadley Falls
Enfield
Belchertown
Ware
Huntington
Holyoke
Chicopee
Chicopee Falls
Springfield
Westfield
Wilbraham
Ludlow
Palmer
Monson
Tolland
Granville
Southwick
Agawam
Long Meadow
East Long Meadow
HAMPDEN
Brimfield
Blandford
Winchendon
Ashburnham
Fitchburg
Gardner
Templeton
Athol
Westminster
Leominster
Petersham
Hubbardston
Barre
Princeton
Rutland
Sterling
Clinton
Hardwick
Holden
North Worcester
Paxton
North Brookfield
West Brookfield
Leicester
Spencer
Auburn
Millbury
Sutton
Charlton
Sturbridge
Southbridge
Webster
Dudley
Oxford
E. Douglass
Townsend
WORCESTER
Mt. Greylock
Mt. Wachusett
Mt. Tom
BOSTON AND VICINITY.
Scale of Miles.
0 1 2 3 4 5
Concord
Lexington
LEXINGTON
Sandy Pond
MIDDLESEX
Lincoln
LINCOLN
Arlington Heights
ARLINGTON
Arlington
BELMONT
Belmont
Winchester
WINCHESTER
STONEHAM
Melrose
MELROSE
MALDEN
Malden
MEDFORD
Medford
EVERETT
Everett
Somerville
Chelsea
Revere
REVERE
SAUGUS
Saugus
Cliftondale
East Saugus
LYNN
Lynn
Nahant
NAHANT
East Pt.
WALTHAM
Waltham
Waverley
WATERTOWN
Watertown
Cambridge
Charlestown
Winthrop
WINTHROP
Weston
WESTON
WAYLAND
Newton
NEWTON
Lower Falls
Part of Boston
Brookline
BROOKLINE
To Norfolk Co.
Boston
Boston Harbor
DEER I.
Massachusetts Bay
South Boston
Roxbury
Dorchester
Mattapan
Milton
MILTON
East Milton
Quincy
QUINCY
Hyde Park
HYDE PARK
Clarendon Hills
Dedham
DEDHAM
NEEDHAM
Needham
Wellesley Hills
WELLESLEY
Wellesley
Highlandville
Cochituate
Felchville
Natick
NATICK
South Natick
Charles R.
SUFFOLK
NORFOLK
LONG I.
Hull
Pt. Allerton
HINGHAM

West 71°30′ from Greenwich 71° 70°30′
Capitals: ....
County Seats: ..
Other places: ..
Railroads: ..
ROCKINGHAM
Salisbury
Salisbury Beach
Merrimac R.
Haverhill
Newburyport
PLUM ISLAND
Lawrence
Lowell
ESSEX
Halibut Pt.
Pigeon Cove
C.Ann
THATCHERS
Gloucester
Eastern Pt.
Manchester
Beverly
Salem
Marblehead
Swampscott
Lynn
Nahant
MIDDLESEX
Woburn
Malden
Medford
Waltham
Newton
Cambridge
Chelsea
Winthrop
Boston
Massachusetts
Bay
Pt.Allerton
Hull
Nantasket
ATLANTIC
OCEAN
Cohasset
Scituate
Dedham
NORFOLK
Randolph
Holbrook
Marshfield
Duxbury
Brockton
Hanson
Gurnet Pt.
Kingston
Plymouth
Rocky Pt.
Manomet Pt.
PLYMOUTH
Middleboro
Carver
Taunton
BRISTOL
Providence
Pawtucket
Fall River
New Bedford
Fairhaven
Dartmouth
Westport
Acushnet
Wareham
Sandwich
Barnstable
BARNSTABLE
Hyannis
Falmouth
Woods Hole
Cape Cod
Provincetown
Wood End
Cape Cod Bay
BILLINGSGATE I.
Wellfleet
Centre Hill Pt.
Peaked Cliff
Orleans
Yarmouth
Dennis
Harwich
Chatham
Harwichport
W.Dennis
Pt.Gammon
MONOMOY I.
Monomoy Pt.
Nauset Beach
Buzzards Bay
Sound
Nantucket Sound
Vineyard Haven
Cottage City
C.Poge
Edgartown
Wasque Pt.
Great Pt.
DUKES
Menemsha Bight
Gay Head
MARTHAS VINEYARD ISLAND
PENIKESE I.
CUTTYHUNK I.
ELIZABETH ISLANDS
Muskeget Channel
MUSKEGET I.
TUCKERNUCK I.
Nantucket
Siasconsett
NANTUCKET
NANTUCKET I.
RHODE ISLAND
Newport
NEWPORT
Bristol
Kingston
East Greenwich
Mystic R.
Chelsea R.
Charlestown
United States Navy Yard
East Boston
Boston
Boston Harbor
1 MILE
South Boston
South Bay
42° 30′
42°
41° 30′

FIG. 35.

in New England, live in the ***Boston Basin*** and the shallow valleys opening from it (Figs. 15 and 36).

Boston Basin. — The lowland of the Boston Basin is dotted with drumlins, some rising from the mud flats of the harbor as islands (Fig. 38), others affording building sites

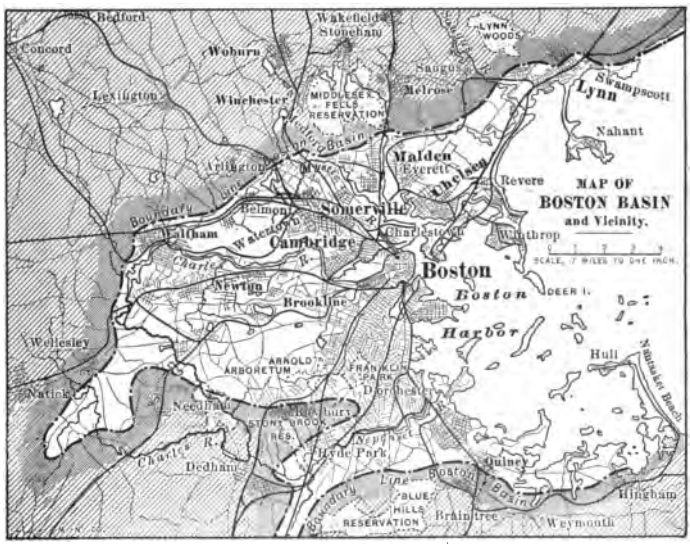


FIG. 36.

Boston Basin.

for the city. Among these are Beacon Hill, on whose summit is the gilded dome of the State House (Fig. 34), and the Charlestown hills, on which the battle of Bunker Hill was fought. Within the basin are extensive salt marshes, whose level surface is crossed by winding tidal creeks; and there are also areas of hard rocks of moderate elevation, such as those of the Highland District at Rox-

bury. An upland rim rises sharply around this oval basin. Its more rugged portions are reserved as wooded parks, such as the Lynn Woods and the Middlesex Fells at the north, and the Blue Hill Reservation at the south.

A broad and deep channel has been dredged in the harbor, leading to the docks of European steamship lines at East Boston, to the Navy Yard at Charlestown, and to the Boston wharves which are used by steamers and schooners from American ports (Fig. 35). The great commerce

FIG. 37.

Marshes, creeks, and drumlins of Revere (Fig. 36).

centred here has made land about the harbor so valuable that many acres of marshes and mud flats have been shut off from the sea and filled in as "made land." This new land is now covered with costly buildings (Fig. 20).

The large cities of CAMBRIDGE, SOMERVILLE, CHELSEA, and EVERETT are continuous with BOSTON on the north, though separately governed. Soon after the Civil War Charlestown, Brighton, Roxbury, and Dorchester were annexed to Boston; but BROOKLINE, although nearly enclosed by parts of Boston (Fig. 35), refused annexation. Its people, numbering twenty thousand, prefer to retain their town form of government.

Many cities and large towns are situated just within the rim of the Boston Basin, where railway lines enter valleys leading from the basin. The more important are LYNN, MALDEN, MEDFORD, WALTHAM, NEWTON, HYDE PARK, and QUINCY. Many people who are engaged in business in Boston have their homes in these cities and towns, and in others outside the basin, like DEDHAM and MELROSE. Most of these suburban places have thriving industries of their own. You have already learned what are the leading industries of Lynn, Chelsea, Malden, Woburn, Waltham, and Quincy (pp. 52, 57, 60, and 61). Market gardening is very important in ARLINGTON and other towns northwest of Boston (p. 46).

To secure a pure and abundant supply of water for the dense population gathered in and about Boston it is necessary to bring it from far inland. The great expense involved requires united action, and therefore by state law a Metropolitan Water Board, appointed by the governor, expends the funds raised by taxation in the sixteen cities and towns that have already entered the Metropolitan Water District. Boston had already built aqueducts to bring water from Lake Cochituate and from reservoirs on the headwaters of the Sudbury River; and now the largest reservoir in the world, with the exception of one in India, has been constructed in the valley of the Nashua River above Clinton (Figs. 9 and 35). The water is gathered from a large area of upland southeast of Mt. Wachusett.

There is also a Metropolitan Sewerage District; and great trunk sewers, through the Mystic, Charles, and Neponset valleys, gather the sewage from the towns and cities near Boston, and carry it to the outer harbor. Besides parks owned by cities and towns, a Metropolitan Park Commission has charge of a great system of public reservations. These are located along the water front (Fig. 38), the river banks, and on the upland border, with connecting parkways, thus holding some of the most beautiful portions of the land for the people.

FIG. 38.

Nantasket Beach, part of the metropolitan park system. The low curves on the left are drumlin islands in Boston harbor.

Naturally Boston is a great educational centre. The colleges and professional schools which constitute Harvard University at Cambridge form a busy and populous community in themselves, and afford employment to many people besides the hundreds of students. Near by, Tufts College overlooks Medford from a drumlin hill. There is a large state school for feeble-minded children at Waltham. Boston itself is the seat of the Massachusetts Institute of Technology, Boston University, Boston College, the Perkins Institute for the Blind, and schools of music, painting, and other fine arts. The Boston Public Library has one of the most valuable collections of books in the country, housed in a noble building.

Piedmont Belt. — Outside the metropolitan districts are three groups of cities and towns engaged in the manufacture of shoes. South from Boston, in BROCKTON and more than a dozen nearby towns, such as WEYMOUTH, there are large factories for making fine shoes for men and boys. Men's shoes are also made in the factories of FRAMINGHAM, MILFORD, and many towns to the west-

ward, while MARLBORO ranks fourth among New England cities in the manufacture of shoes. North of Boston, women's shoes are a specialty, notably at SALEM, BEVERLY, and several large towns near LYNN, which has always been the leading centre for this industry. What places in this district tan leather (p. 57)?

Farther from Boston most manufacturing communities of the Piedmont belt are engaged in the manufacture of textile goods, although the manufacture of shoes is also important toward the north, and that of metallic goods toward the south. LOWELL, the "City of Spindles," and LAWRENCE, where over half the worsted cloth (p. 55) made in the state is woven, use the water power of the Merrimac (p. 22), and also steam power. Textile mills are also located at the falls of tributary streams in several adjoining towns. HAVERHILL ranks third among cities making shoes, its specialty being women's low cut shoes, or oxfords. Shoe manufacture is the leading industry at NEWBURYPORT (Fig. 30) also, and there are shoe factories in all the cities of the Merrimac valley and in several of its towns. AMESBURY manufactures carriages.

WORCESTER, the "heart of the commonwealth," is in a valley at the western border of the Piedmont belt. As it is the third city of New England in size, and the trade centre for surrounding factory villages, its manufactures, in addition to its great production of machinery and wire (p. 62), are many and varied. CLINTON manufactures carpets (p. 55). SOUTHBRIDGE, WEBSTER, and other towns on the headwaters of the Quinebaug and Blackstone have many textile mills. Straw goods are made in the towns near FRANKLIN. Many years ago hats were made in this vicinity from braided straw, in imi-

tation of those imported from Europe, and this household industry was later transferred to factories.

In Bristol County are the cotton-manufacturing cities of FALL RIVER, NEW BEDFORD, and TAUNTON (p. 53). Nearly half the products of Taunton are metallic goods, — tacks and nails, stoves and furnaces, machines and tools (pp. 61 and 62). The manufacture of jewellery and silverware, which centres at Providence (p. 61), has brought prosperity to the neighboring Massachusetts towns, ATTLEBORO and NORTH ATTLEBORO.

Owing to its shallow harbor, PLYMOUTH remains a town, although it is the oldest settlement in New England. The products of its various factories include cordage and tacks. The city of GLOUCESTER has a better harbor, and has so developed its early interest in the fisheries that two-thirds of this business in the state now centres there (p. 33). It has manufactories connected with the fisheries, including fish glue, anchors, nets, and twine. It is also one of the leading centres for granite (p. 49). Along the seacoast, from Cape Ann to Plymouth, many Boston families have their summer homes.

In the Piedmont region there are a number of important educational institutions; for instance, Wellesley College for women, at Wellesley (Fig. 36). Worcester is the seat of Clark University, the College of the Holy Cross, and Worcester Polytechnic Institute.

Cape Cod. — Cape Cod and the islands of Martha's Vineyard and Nantucket consist of moraine hills and sandy plains that were deposited from the glacier (p. 8). Their soils are not generally fertile, and large areas are covered with a scrubby growth of trees, where a few deer still live. Once all the towns were prosperous, and ex-

tensively engaged in fishing and commerce. Now, since more than half the fishing schooners of the Cape sail from PROVINCETOWN, Nantucket and the little villages of Cape Cod beyond Barnstable are losing population. Many summer residents, attracted by the ocean breezes, which make the summer climate cooler than that of interior counties, have built cottages in the western towns of Cape Cod, and on Martha's Vineyard and Nantucket.

FIG. 39.

Outer cliff of Cape Cod — Highland Light (p. 13).

Nantucket was formerly celebrated for its whaling industry. Whales were numerous near the island at first. When sighted, boats were manned, the whales harpooned, and the blubber, or fat, made into oil. The demand for the oil for use in lamps made the industry important, and the daring sailors of NEW BEDFORD, NANTUCKET, STONINGTON, NEW LONDON, and many lesser ports, hunted whales and seals in all the oceans. Partly on account of the decrease in the number of whales and partly because of the discovery of petroleum and the use of kerosene oil, the whaling industry has declined. There is only a small American whaling fleet to-day, and the chief value of the catch is in the whalebone.

As already mentioned (p. 43), cranberries are an important

agricultural product from Plymouth to Provincetown. The rich soil of the bogs is cleared of bushes, and covered with sand to prevent the easy growth of weeds. Cranberry plants are set out, and in time they cover the sand with a mat of vines, which are crowded with dark red berries in September. Winds from the sea tend to prevent early frosts. Many children share in the work of carefully picking the berries.

Connecticut Valley. — The densest population in western Massachusetts is in the southern part of the broad Connecticut valley (Fig. 15). Where the Connecticut and its tributaries have cut away the sands of the flood-plain terraces to the sandstone ledges beneath (p. 10), the water power available has occasioned the growth of the manufacturing cities of HOLYOKE (Fig. 14), CHICOPEE, and NORTHAMPTON, and of a half dozen towns of which WESTFIELD is the largest. SPRINGFIELD, the railway and trade centre for the district, has become its largest city. It has varied manufactures. Firearms are made in the United States arsenal here. What manufacturing interests are prominent in the other cities (pp. 56, 62)? At the northern part of the valley, where the railway that passes through the Hoosac Tunnel crosses from the valley of the Millers River to that of the Deerfield, there is situated the pretty town of GREENFIELD, a railway centre. Near by are the mills of TURNER'S FALLS. There are well tilled farms throughout the valley (p. 83).

HOLYOKE is the leading American city in the manufacture of fine paper from rags. The industry is important at other places in the Connecticut valley. Rags are received from the nearby seaports and great cities, and the water of this section is specially adapted to paper manufacture. In the paper mills the rags are sorted and freed from buttons and dust, then cut, boiled, and soaked in chemicals until they form a mass of pure

white pulp. This is washed, ground finer still, colored to the shade desired, and then made into paper (p. 41). The sheets are dried, rolled smooth, cut to size, and prepared for sale.

Some of this high-grade paper is made into envelopes and letter sheets, and some is sold to be made into ledgers or to be printed as bonds and stock certificates.

FIG. 40.

The Connecticut Valley from Mt. Holyoke. Compare Fig. 2.

The pleasant and prosperous Connecticut valley is the seat of numerous important colleges and higher schools throughout its length. In Massachusetts are Amherst College and the State Agricultural College at AMHERST, and two colleges for women, — Mount Holyoke College at SOUTH HADLEY, and Smith College at NORTHAMPTON.

Uplands and Valleys. — The decreasing population of the upland towns, their deserted farms, the small trading

villages, the coming of summer boarders and summer residents, have been mentioned. The only large towns on the central upland are GARDNER, with its chair factories, and SPENCER, with its shoe shops, each situated near where the main line of a railway rises to the upland level.

The largest places are in the narrow valleys where the rivers afford water power and the railways communication. PALMER and WARE toward Springfield, and FITCHBURG and LEOMINSTER at the north, are good examples. In the city of FITCHBURG a great variety of products is manufactured in the large worsted, cotton, and paper mills, the machine shops, shoe shops, and bicycle works.

In Berkshire County the Housatonic and Hoosac rivers have cut an open and fertile valley in a belt of limestone rocks, and in this valley many people live. Marble is quarried at LEE. At the north the railway from Boston through the long tunnel beneath Hoosac Mountain has helped to bring prosperity to the cotton mills of ADAMS and to the textile mills and shoe shops of the city of NORTH ADAMS.

Williams College is in WILLIAMSTOWN. The city of PITTSFIELD, on the main line of the Boston and Albany, is well located to secure the trade of the Berkshire valley. Woollen cloth, electrical machinery, and varied products are made here. Fine papers are made in several of the towns of the county. All the paper for bank notes is made at DALTON. In towns south of Pittsfield, and especially at LENOX, the beautiful scenery has led wealthy people from New York to erect costly dwellings for summer homes. The summit of Mount Greylock is a state reservation, and other reservations are planned.

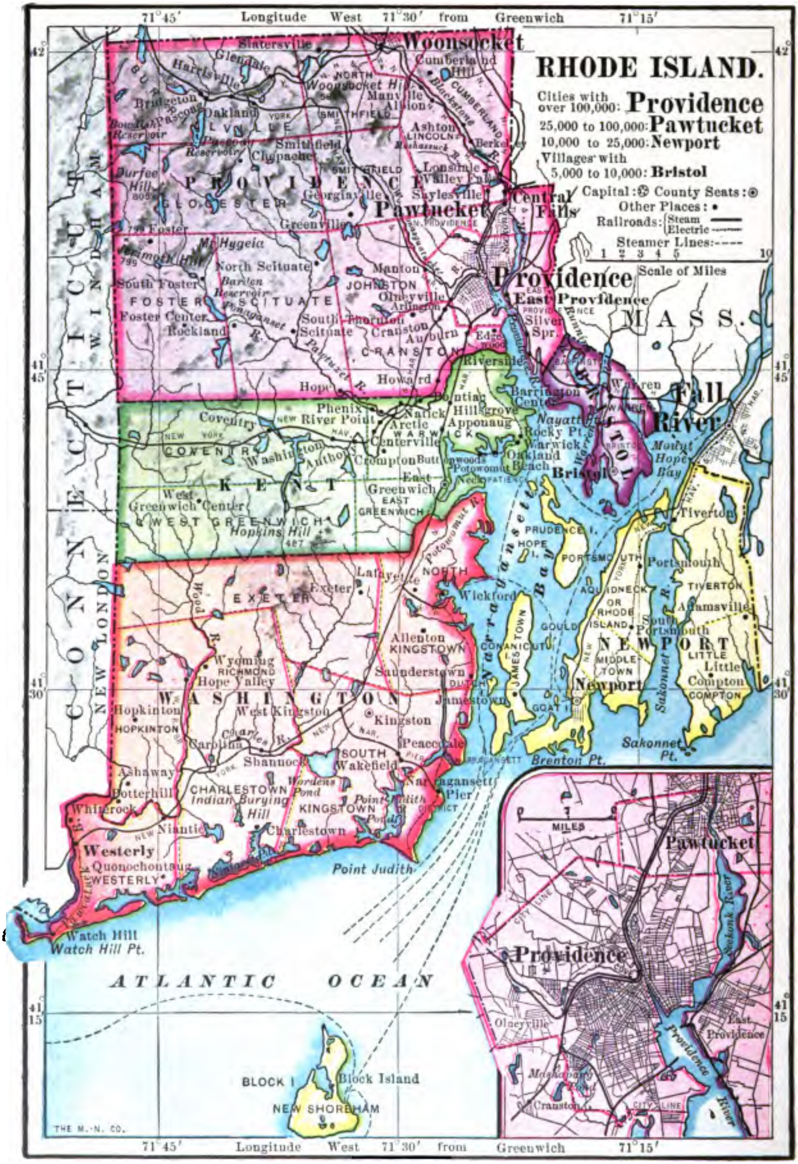

RHODE ISLAND.
Cities with over 100,000: Providence
25,000 to 100,000: Pawtucket
10,000 to 25,000: Newport
Villages with 5,000 to 10,000: Bristol
Capital: County Seats:
Other Places:
Railroads: Steam Electric
Steamer Lines:
Scale of Miles
Longitude West 71°30′ from Greenwich
71°45′
71°15′
Woonsocket
Pawtucket
Providence
East Providence
Central Falls
Fall River
Newport
Bristol
Westerly
Watch Hill
Watch Hill Pt.
Point Judith
Brenton Pt.
Sakonnet Pt.
ATLANTIC OCEAN
Block Island
BLOCK I
NEW SHOREHAM
MASS.
CONNECTICUT
WINDHAM
NEW LONDON
PROVIDENCE
KENT
WASHINGTON
NEWPORT
BRISTOL
Narragansett Bay
PRUDENCE I.
CONANICUT
Jamestown
Wickford
Kingston
Peacedale
Narragansett Pier
Hopkinton
Charlestown
Tiverton
Portsmouth
Little Compton
Adamsville
Warwick
East Greenwich
Coventry
Scituate
Foster
Glocester
Cranston
Johnston
Smithfield
Lincoln
Cumberland
Exeter
Richmond
Hope Valley
Wyoming
West Kingston
Wakefield
Shannock
Ashaway
Quonochontaug
Lafayette
Saunderstown
Hopkins Hill
Slatersville
Harrisville
Chepachet
Greenville
Georgiaville
North Scituate
Olneyville
Arlington
Auburn
Riverside
Barrington Center
Warren
Apponaug
Phenix
River Point
Crompton
Centerville
Natick
Howard
Hope
Saylesville
Lonsdale
Berkeley
Ashton
Manville
Albion
Oakland
Mt. Hygeia
Jerimoth Hill
Durfee Hill
Allenton
Carolina
Niantic
Potterhill
Whiterock
Block Island
MILES
Seekonk River
Providence River
Mashapaug
Cranston
THE M.-N. CO.

FIG. 41.

RHODE ISLAND

Rhode Island, the smallest state in the Union, is remarkable for having the largest population for its area of any state. But the people are not uniformly distributed throughout its territory. Four-fifths live at the head of Narragansett Bay and along the rivers centring there, making this district, with the exception of the Boston Basin, the most densely settled in New England (Fig. 15).

Most of the Narragansett Basin within the state has been submerged, or drowned, by a sinking of the land. This has caused good harbors near the falls which occur where the streams descend from the uplands bordering the basin (p. 53). A profitable commerce early developed at these inland harbors, and some of the capital gained was invested in manufacturing at the nearby water powers (p. 23). More recently great mills dependent upon coal for power have been built at the head of the bay. Thus the physiography of Rhode Island has enabled its people to become so successful a manufacturing community that the state stands preëminent in the value of its manufactures as compared with the size of its population.

Textile manufactures constitute half the total product, machinery and metal goods an eighth, and jewellery and silverware nearly as large a proportion. Rubber shoes are the most important minor product.

Providence and Vicinity. — PROVIDENCE is the capital of Rhode Island. It was originally a lumber-shipping port, although now the remaining wooded tracts of the uplands and the swamps supply little except firewood. A large foreign commerce developed here (p. 20), since its harbor, like that of Boston (p. 63), is centrally located at the head

of a bay. While the exports are insignificant, because the state's manufactured products are sent to New York or Boston for shipment, raw materials are still imported. Typical imports are fibres, steel bars, precious stones, india rubber, dyewoods, and chemicals. Coasting vessels bring much coal, also lumber and building materials; while the steamship lines from New York and other coast ports carry general merchandise as well as passengers.

Among New England cities Providence is next to Boston in size, for its position has favored manufacturing as

FIG. 42.

Providence. Railway station in foreground, Capitol on the right, and Normal School in the center, in the distance.

well as commerce. The value of its manufactures is half the total for the state. Providence leads New England cities in the manufacture of worsted goods (p. 54), and has extensive bleaching, dyeing, and printing works, as well as cotton mills. Almost all the jewellery and silverware made in the state is manufactured here, also a large proportion of the iron and steel products, which include heavy machinery, screws, files, and fine tools. Suburban manufacturing villages in EAST PROVIDENCE, JOHNSTON, and CRANSTON are rapidly growing as residential places;

and a system of sewers has been extended to the suburbs. Providence is the seat of Brown University.

North of Providence, the cities of PAWTUCKET and CENTRAL FALLS, with adjoining villages, form a smaller manufacturing centre, which is reached by coal vessels of light draught (p. 23). Cotton goods are here more important than woollens, and there are cotton mills in successive villages along the Blackstone River, in the towns of CUMBERLAND and LINCOLN (Fig. 29). WOONSOCKET is the third largest city in the state. It produces cotton and woollen goods, machinery, and rubber shoes.

At the water powers of the smaller rivers, in the villages of JOHNSTON, BURRILLVILLE, and several towns northwest of Providence and west of Woonsocket, woollen goods are manufactured. Southwest of Providence there are many cotton mill villages on the Pawtuxet River (p. 52), in the populous town of WARWICK and in COVENTRY. The towns of Bristol County, on the low peninsulas (Fig 43) that extend into the bay between Fall River and Providence, also manufacture cotton and woollen goods. BARRINGTON has great brickyards. BRISTOL is widely known, since several noted yachts have been built there to defend the America's Cup against English challengers. Torpedo boats for the navy are also built at Bristol.

Narragansett Bay. — Many of the low hills of the former Narragansett lowland are now islands (p. 7), separating the bay into north and south channels. The outer end of the island of Aquidneck, or Rhode Island, is composed of granite, and protects the fine harbor of NEWPORT. A large foreign commerce was developed there in colonial times. Later this was lost to mainland ports like Providence; but the outer harbor, that of Newport, has continued to be most convenient for fishing fleets. Now,

shallow lagoons (p. 13). Since there are no good harbors, few people live on the shore and the moraine. WESTERLY, the port at the mouth of the Pawcatuck River, is the largest town of Washington County. Its factories produce cotton and woollen goods, printing presses, and other machinery, and there are important granite quarries (p. 49). WATCH HILL, at the western end of the moraine, is a summer resort.

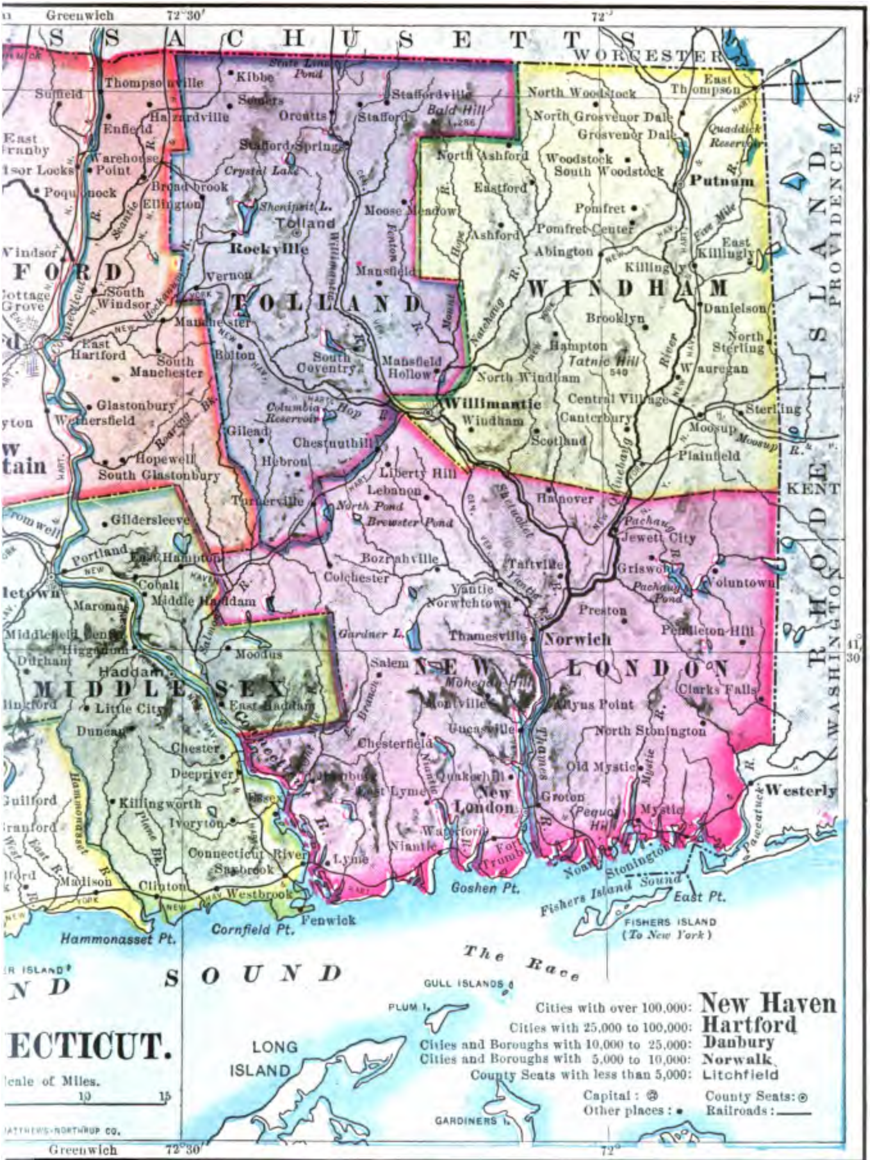
CONNECTICUT

Central Lowland. — Most of Connecticut consists of the southern slopes of the New England upland; but the state is crossed from north to south by the sandstone lowland of the Connecticut valley. Nearly half the people of the state live in this lowland strip, for several industries find favorable conditions there (compare p. 74). For instance, the sandstones are quarried for building purposes, and the blocks are shipped down the river to coast cities.

The Connecticut River and its tributaries occupy the valley north of Middletown; the deep clayey loam of the river terraces (p. 10) is fertile, and agriculture has prospered here from the earliest days. At Middletown the river turns eastward in its course to the Sound at Saybrook; but it has worn only a narrow valley in the hard rocks of the upland. The broad lowland continues to New Haven, the sandstones having been removed, as fast as they weathered, by the Quinnipiac and other small streams. This part of the valley is overspread by glacial sands and is less fertile than the flood-plain terraces.

The lowland conditions are more favorable to agriculture than those of the uplands. The soil is better and the

73° 30′
73°
Longitude West
HAMPDEN
LITCHFIELD
FAIRFIELD
NEW HAVEN
DUTCHESS
PUTNAM
WESTCHESTER
NEW YORK
LONG ISLAND
Canaan
East Canaan
Salisbury
Norfolk
Colebrook
West Hartland
Hartland
Lakeville
State Line Jc.
Falls Village
Winsted
West Winsted
South Norfolk
Riverton
Barkhampsted
Sharon
West Cornwall
Newfield
Burrville
New Hartford
Ellsworth
Nepaug
Bakersville
Cornwall Bridge
Torrington
Collinsville
Avon
North Kent
Litchfield
Harwinton
Burlington
Unionville
Hartford
West Hartford
Kent
Bantam Lake
Thomaston
Terryville
Bristol
New Preston
Long Meadow Pond
Plymouth
Forestville
Bethlehem
Washington
Watertown
Oakville
Waterbury
New Milford
Roxbury
Woodbury
Bridgewater
Middlebury
Union City
West Cheshire
Naugatuck
Cheshire
Meriden
South Meriden
Brookfield
New Fairfield
Towantic
Oxford
High Rock Grove
Wallingford
Bennett Bridge
Bethany
Danbury
Newtown
Sandy Hook
East Danbury
Stevenson
Seymour
Hamden
North Haven
Bethel
Botsford
Ansonia
West Rock
Derby
Stepney
Monroe
Shelton
Redding Ridge
Redding
Ridgefield
Huntington
Tyler City
Westville
New Haven
East Rock
Orange
Westhaven
Branchville
Georgetown
Easton
Oronoque
South End
Milford
North Bridgeport
Stratford
Pond Pt.
Wilton
Bridgeport
Fairfield
Stratford Pt.
Highridge
New Canaan
Westport
Southport
Saugatuck
Norwalk
Pine Creek Pt.
Stanwich
Springdale
Darien
South Norwalk
NORWALK ISLANDS
Stamford
Glenville
Noroton
SHEFFIELD I.
Greenwich
Shippan Pt.
Greenwich Pt.
CAPTAINS I.
Brewster
Housatonic R.
Naugatuck R.
Saugatuck R.
Norwalk R.
Mianus R.
Byram R.
Mill R.
Noroton R.
Pomperaug R.
Shepaug R.
Aspetuck R.
Farmington R.
Quinnipiac R.
Ten Mile Cr.
Harbor
CONN



Greenwich
72°30′
72°
42°
41° 30′
MASSACHUSETTS
WORCESTER
TOLLAND
WINDHAM
NEW LONDON
MIDDLESEX
RHODE ISLAND
PROVIDENCE
KENT
WASHINGTON
Thompsonville
Kibbe
State Line Pond
Staffordville
Bald Hill 1,286
Stafford
Somers
Orcutts
Hazardville
Enfield
Suffield
Warehouse Point
Stafford Springs
Crystal Lake
Broad Brook
Poquonock
Ellington
Shenipsit L.
Tolland
Rockville
Moose Meadow
Mansfield
Vernon
South Windsor
Manchester
East Hartford
South Manchester
Bolton
South Coventry
Mansfield Hollow
Glastonbury
Wethersfield
Columbia Reservoir
Gilead
Chestnuthill
Hebron
Hopewell
South Glastonbury
Turnerville
Gildersleeve
Portland
East Hampton
Cobalt
Middle Haddam
Maromas
Middletown
Middlefield Center
Higganum
Durham
Haddam
Moodus
East Haddam
Little City
Duncan
Chester
Deepriver
Killingworth
Ivoryton
Essex
Connecticut River
Saybrook
Westbrook
Clinton
Madison
Guilford
Fenwick
Hammonasset Pt.
Cornfield Pt.
North Woodstock
East Thompson
Thompson
North Grosvenor Dale
Grosvenor Dale
Quaddick Reservoir
North Ashford
Woodstock
South Woodstock
Putnam
Eastford
Pomfret
Pomfret Center
Ashford
Abington
East Killingly
Killingly
Danielson
Brooklyn
Hampton
Tatnic Hill 540
North Sterling
Sterling
Wauregan
North Windham
Willimantic
Windham
Central Village
Canterbury
Scotland
Moosup
Plainfield
Liberty Hill
Lebanon
North Pond
Brewster Pond
Hanover
Pachaug
Jewett City
Bozrahville
Colchester
Taftville
Griswold
Voluntown
Yantic
Norwichtown
Pachaug Pond
Preston
Gardner L.
Thamesville
Norwich
Pendleton Hill
Salem
Mohegan Hill
Montville
Clarks Falls
Uncasville
North Stonington
Chesterfield
Old Mystic
Quakerhill
East Lyme
New London
Groton
Mystic
Westerly
Waterford
Niantic
Fort Trumbull
Lyme
Noank
Stonington
Goshen Pt.
Fishers Island Sound
East Pt.
FISHERS ISLAND (To New York)
The Race
SOUND
GULL ISLANDS
PLUM I.
LONG ISLAND
GARDINERS I.
ECTICUT.
Scale of Miles.
10
15
MATTHEWS-NORTHRUP CO.
Cities with over 100,000: New Haven
Cities with 25,000 to 100,000: Hartford
Cities and Boroughs with 10,000 to 25,000: Danbury
Cities and Boroughs with 5,000 to 10,000: Norwalk
County Seats with less than 5,000: Litchfield
Capital: ⊛
County Seats: ⊙
Other places: •
Railroads: ——

FIG. 44.

FIG. 45.

The Hanging Hills of Meriden, formed by broken and tilted lava beds (p. 7).

climate milder. Dairy farms and market gardens (pp. 46 and 47) abound in the lowlands near the cities, and some valley farms raise garden seeds (p. 48). There are large peach orchards. Much seedleaf, or Havana, tobacco is grown, and it is sold for use as cigar wrappers.

The heavy soils of the lowest terrace, containing much clay and fine silt, and therefore retentive of moisture, give a large yield of heavy, coarse tobacco. The light sandy soils of higher terraces produce a light-colored, thin-textured leaf, which is now much preferred. The leaves are dried and cured in tobacco barns. These have walls with many shutters, which are opened in pleasant weather to allow the air to circulate through the tobacco as it hangs within.

The growth of cities and large towns in the Connecticut valley lowland is due to the commercial advantages and the consequent development of manufacturing by the energy and inventive enterprise of the people. Even in colonial days, clocks, tinware, and "Yankee notions" were made by hand in the valley towns and sold from pedlers' carts. The railways that have easily been built along the lowland have greatly stimulated production. They bring the coal, metals, fibres, etc., for use in the

factories, and convey the manufactured goods to all parts of the country or to New York for export.

Instead of producing large amounts of a few staple products like cotton cloth or shoes, the factories of every city and town make a great variety of goods. More than twelve hundred articles and kinds of products are listed in the state reports as regularly manufactured in Connecticut. However, various brass goods constitute over a fourth of the value of the state's entire product; and textiles, manufactures of steel and iron, and rubber goods aggregate nearly half the total. Paper goods (p. 74), silver and plated ware, corsets, hats, and musical instruments are produced to the value of several million dollars each.

HARTFORD, the capital, owes much of its growth to its position at the head of navigation on the Connecticut (p. 23). Numerous steam and electric railways radiate from the city through the surrounding agricultural country and manufacturing towns. Naturally, therefore, it is a great trading and business centre. There are extensive manufacturing plants, which make machinery, firearms, bicycles, and many other goods; and many insurance companies have their home offices in Hartford.

Toward Springfield there are a few manufacturing villages. For example, there are great carpet mills at Thompsonville (p. 55), and powder mills at Hazardville, two villages of ENFIELD. Beyond the suburb of EAST HARTFORD are the silk mills of SOUTH MANCHESTER, where several generations of mill owners have lived near their operatives and cared for their welfare. An electric road extends to ROCKVILLE, at the upland border, where woollen goods and other textiles are made.

A few miles to the south of Hartford is the city of NEW BRITAIN, the leading centre for the manufacture

of hardware. BRISTOL and SOUTHINGTON are the largest of several nearby manufacturing towns. A little farther south, MERIDEN produces more silver-plated ware than any other city in the country, and MIDDLETOWN and WALLINGFORD are important manufacturing places. Every one of these six manufacturing communities contains many factories, which make a great variety of products.

The largest city of Connecticut is NEW HAVEN, which resembles Boston and Providence in its situation at the head of the drowned portion of a lowland basin. In

FIG. 46.

New Haven from East Rock. Compare Fig. 2.

colonial days it exported meat and lumber to the West Indies. After the Revolution its commerce increased, and a large trade was carried on with China; but since the Civil War manufacturing has been the leading interest. Raw materials are supplied and products distributed by an extensive coastwise trade. The early manufactures of carriages, clocks, and locks are now supplemented by those of firearms, rubber goods, and other articles. The main offices and the construction and repair shops of the great railway system of southern New England are at New Haven, and give support to a tenth of the people.

There is a fine park system, which includes parts of the bay shores and affords views from East Rock (Fig. 46) and West Rock, which are lava ridges. The beautifully shaded streets about Yale University and the "Green" have suggested the name "Elm City" for New Haven.

Yale University is one of the leading educational institutions of the country, and most of the higher schools of the state are likewise in the cities of the Connecticut valley lowland. Trinity College occupies a commanding site in the outskirts of Hartford, and Middletown is the seat of Wesleyan University.

Coast. — The coast of Connecticut is less irregular than that of Maine because the land is lower and less deeply drowned; but the large rivers of the state have long tidal estuaries, and there are many small harbors. Sands and clays from the melting glacier filled the heads of many bays, forming plains which are easily cultivated. The growth of salt marshes, as at New Haven (Fig. 46), has further reduced the size of the indentations.

The sheltered waters of Long Island Sound favor the growth of oysters; and the planting of oyster beds and dredging for oysters are important along the entire coast. Most oysters are brought to market at NEW HAVEN, SOUTH NORWALK, and other large ports near New York City.

When oysters became scarce on the natural beds along the shore of Connecticut, they were brought in schooner loads from Chesapeake Bay to New Haven harbor, and laid down on a sandspit there to fatten for market in the fall. Small oysters were also dredged in the Sound and placed on private grounds in the shallow waters of many bays, and, after a few years' growth, were taken up for market. The oyster, when first born, swims or floats freely in the water, but soon attaches

itself to any clean, hard substance it meets. Therefore it came to be the practice to scatter mother oysters over selected portions of the bottom of Long Island Sound, and at the spawning season, early in July, to spread the same ground freely with boat loads of old oyster-shells to which the young oysters might attach themselves. Thus many oysters were led to settle and grow in places where there had formerly been few. To-day the bottom of Long Island Sound, out to the New York state line, is largely in the hands of private owners.

In years past, NEW LONDON and STONINGTON were very prosperous ports, with great whaling and sealing fleets (p. 73). Now the manufacture of textile goods and machinery is more important to them than commerce or fisheries. At each port steamboats plying to New York exchange freight and passengers with railways that run to the cities of Massachusetts and Rhode Island. The harbor of New London is the best on the Sound; there is a United States navy yard there, and many yachts make the river gay in summer (p. 34). Between New London and Stonington is GROTON, where shipbuilding (p. 21) still continues.

In recent years the ports near New York have been best situated for growth as manufacturing and residential centres (Fig. 15). BRIDGEPORT, one of these, is the third city in the state. Its factories produce sewing machines, ammunition, heavy metallic goods, and many special products. STAMFORD and GREENWICH, and the two cities of NORWALK and SOUTH NORWALK, are other coast points engaged in manufacturing.

Western Upland. — The upland rises to fifteen hundred feet in height in the northwest, and a number of peaks upon it are several hundred feet higher. The rivers flow

southward in narrow valleys, which are followed by the railways. One line crosses the upland from the Connecticut valley to that of the Hudson River, but by steep grades.

The interests of the higher uplands are those characteristic of Vermont (p. 100). For example, dairy farming is the leading industry of many towns. The quiet beauty of LITCHFIELD and other towns attracts summer residents

FIG. 47.

The Naugatuck valley. Notice the upland level. Where are the railways?

(p. 28). The valley lands are more fertile than the uplands; for instance, much tobacco is grown in NEW MILFORD in the Housatonic valley. Iron is still mined and smelted in several towns along the northwest border (p. 60).

The valley of the Naugatuck, from its highest tributaries to tidewater, has been made the seat of busy industries by the energy and skill of its people. The cities of WATERBURY, ANSONIA, and DERBY and the boroughs of TORRINGTON and NAUGATUCK are the important

points. WINSTED is a little farther north, and SHELTON a little south at the head of navigation on the Housatonic River. A long list of manufactured articles is produced in every place. WATERBURY is the fourth city of Connecticut and is growing rapidly. It is a railway centre and is therefore closely connected with the cities of the Connecticut lowland. Its manufactures of metals are both extensive and varied, including a product of several thousand watches and clocks every day; but it is most noted as the centre of the brass industry in America.

A century ago metal buttons were made in Waterbury, and the use of brass for this purpose led to the rolling of brass, and the manufacture of many other articles from it. Three-fourths of the brass rolled in the country is made in the Naugatuck valley, and the few mills now in operation elsewhere were established by Connecticut men. Here has been developed the skill necessary to combine properly the copper and zinc to form brass, and to roll it into plates or draw it out into wire that shall be exact to size, even to the fraction of a thousandth of an inch. This most valuable of all alloys is easily worked, and may be cast, rolled, drawn, or stamped into shape for use; and when it is finished, it is not only hard and strong, but easily takes a beautiful polish.

DANBURY, another railway centre, has for a century been the leading community in the country for the manufacture of hats and caps. Machinery for cutting fur, and for felting and shaping it into hats, is made there.

Eastern Upland. — The eastern upland is lower than the western, and is mainly within the Piedmont belt. While two railways follow valleys northward from Norwich into Massachusetts, two others wind across the upland from valley to valley, connecting Boston and New York, and Providence and Hartford, by the most direct routes.

The section is closely allied to Massachusetts and Rhode Island in its interests; for instance, the textile industry leads in the cities and boroughs of the valleys (p. 52). A Boston milk train starts from Willimantic (p. 46), and outside the manufacturing communities dairy farming is the leading industry, as elsewhere in New England.

NORWICH is the largest city in eastern Connecticut. Its position at the head of tidewater (p. 23) favored its commerce in the past, as it favors its manufacturing interests to-day. Its mills use both water power and steam in making cotton and woollen goods, paper, and a variety of machines and other steel and iron products. PUTNAM and villages in THOMPSON, KILLINGLY, PLAINFIELD, and several towns near Norwich, use the water power of the Quinebaug and smaller rivers in manufacturing cotton goods and other textile products. The city of WILLIMANTIC is situated on the Shetucket River at the point where several railway lines must cross each other. The cotton thread (p. 56) and sewing silk produced there have made the city's name familiar. Farther up the valley the villages of STAFFORD are engaged in woollen manufacturing (p. 54).

Young mulberry trees and silk-worm eggs were brought to Windham County before the Revolution, and the production of raw silk was then commenced. Early in the last century, this experiment in raising silk was extensively tried throughout eastern Connecticut, and sewing silk was spun on the farms. For a time the skeins of silk were used like money as a medium of exchange. A blight appeared which destroyed the trees and stopped the production of silk; but for many years thereafter Connecticut was the leading state in the manufacture of silk cloth and twist from imported silk (p. 56).

NEW HAMPSHIRE

The White Mountains. — The "Granite State," famous for its mountain scenery, attracts many visitors every year. In the southwestern counties lone peaks (Fig. 53), like Monadnock, rise above the general level of the upland, and northward are groups of mountains. The northern part of the state is composed of such hard rocks that most of the surface consists of forest-covered mountains.

FIG. 48.

The Presidential Range in winter, from the west. Compare Fig. 49.

In the central White Mountains the peaks rise to a height of a mile or more above sea level, and are divided by deep valleys into irregular groups or ranges. The Presidential Range is the best known. During the summer, trains ascend the cog-wheel railway to the hotel at the summit of Mt. Washington, nearly a mile higher than the railway which passes through Crawford Notch.

The notches are north and south valleys which were greatly deepened when glacial ice was crowded through them. The Franconia, Crawford, and Pinkham notches afford the only direct routes for highways between the

FIG. 49. — C.N., Crawford Notch; P.N., Pinkham Notch; Mt. W., Mount Washington.

towns of the Ammonoosuc and Androscoggin valleys on the north and those of the Pemigewassett and Saco valleys to the south. For instance, a highway passes from LITTLETON to PLYMOUTH through Franconia Notch (Fig. 5).

FIG. 50.

Crawford Notch, from Mt. Willard, looking south. Compare Fig. 49.

There are large hotels for summer tourists in the notches (Fig. 5), and in some of the surrounding villages, such as BETHLEHEM and NORTH CONWAY; and in all the mountain towns there are many boarding houses. Tens of thousands of people come here yearly to escape the cares of city life, and to gain health and pleasure while climbing the mountain trails, driving along picturesque country roads, enjoying outdoor sports, or quietly watching cloud shadows pass across the grand mountain views (p. 28).

There are also many boarding houses and cottage homes on the southern upland, especially on the shores of Lake Winnipesaukee, Lake Sunapee, and other beautiful sheets of water. Other summer resorts are along the coast, at Hampton and Rye beaches, and on the Isles of Shoals. The celebration of "Old Home Week" brings back to their childhood home many natives of the state who now live in distant cities. It is estimated that over five million dollars is expended yearly among two hundred towns by visitors from outside the state.

North of the White Mountains the forests are continuous with those of Maine, and logs are floated down the Androscoggin and the swift headwaters of the Connecticut to falls, where mills convert them into lumber, paper pulp, and paper (p. 41). From the large mills of BERLIN, the only city north of the mountains, pulp and paper are sent to all states east of the Mississippi River. Lumber railways have been extended up many valleys of the White Mountains to bring the logs out to the mills; but the desire is increasing that the forests, so essential to the beauty and attractiveness of the mountain scenery, and so useful in preventing the water of the rains and melting snows from running rapidly off, may be preserved as a state reservation (p. 76).

Piedmont and Merrimac Valley. — Half the people of the state live in the Merrimac valley and in the southeastern counties, which belong to the Piedmont belt. Here are most of the cities and large towns, whose people are mainly employed in trade and in the manufacture of textiles, shoes, and machinery.

The coast consists mainly of broad sandbar beaches, built by the sea waves, and broad tidal rivers (p. 13). Farther inland there are clay beds, affording material for

brickyards. Sandy plains of glacial drift cover much of the Piedmont country between the terraced flood-plains (p. 10) of the Saco and those of the Merrimac. The farms of this section produce milk and vegetables for use in the cities and towns, or to be sent by rail to Boston. Several towns have creameries for making butter from milk produced by the herds of many farms. One creamery is at the State Agricultural College in DURHAM.

PORTSMOUTH, on the estuary of the Piscataqua, has the only good harbor of the state. Its commerce made it at one time the largest city, but now those manufacturing cities which use water power, and which are connected with Boston by railway, are much larger. A United States navy yard is located on Portsmouth harbor, at KITTERY, Maine. Near Portsmouth the city of DOVER, and several towns like EXETER, are situated where the falls of small rivers enter tide-water; and on falls farther inland are ROCHESTER and SOMERSWORTH. These places are engaged in the manufacture of cotton and woollen goods, shoes, and products from wood and metals. There are shoe factories in many smaller towns of the state, as in FARMINGTON, DERRY, and SALEM in this southeastern district. Half the manufactured products of the state, in value, consist of cotton goods and shoes, in about equal proportion. Lumber, paper, and other manufactures of wood together amount to one-fifth of all.

The three largest cities of the state — MANCHESTER, the "Queen City," NASHUA, and CONCORD — are on the Merrimac. The water from above the dam at Amoskeag Falls passes into a system of canals on the left bank of the river (p. 22), supplying the power for many of the cotton mills and other factories of MANCHESTER (p. 52).

Besides cotton cloths, the products of these factories include locomotives, fire engines, woollen cloth, hosiery, clothing, paper, shoes, leather, wagons, and manufactures of wood. At NASHUA there are cotton mills which use the water power of the Nashua River, and there

FIG. 51.

Manchester. Mill tenements, the old cotton mills, the new steam mills, west of the Merrimac, and operatives' houses.

are other factories which produce a variety of goods. CONCORD owes its growth in part to being the state capital. The manufacturing interests (pp. 49, 62), although important and varied, do not equal those of some smaller cities. LACONIA, FRANKLIN, and TILTON use the power of the waters from Lake Winnepesaukee. Factories for knitting hosiery and for making knitting machinery are

FIG. 52.

A few of the public buildings in Concord. The capitol, high school, government building of the national government, and state library.

numerous in Laconia. There are cotton mills at SUNCOOK.

Upland and Valleys. — The towns of the upland in the southern part of the state number but a few hundred people each. Like most upland farming towns of New England, they are slowly losing population. The total population for the state, however, increases because of the great gains in the cities (pp. 123, 124). There are many waterfalls on the small rivers which descend through narrow valleys to the Connecticut and Merrimac. Railways follow the valleys, and since water power and ease of communication are there combined, the largest villages are found in these valleys. In the villages along the Ashue-

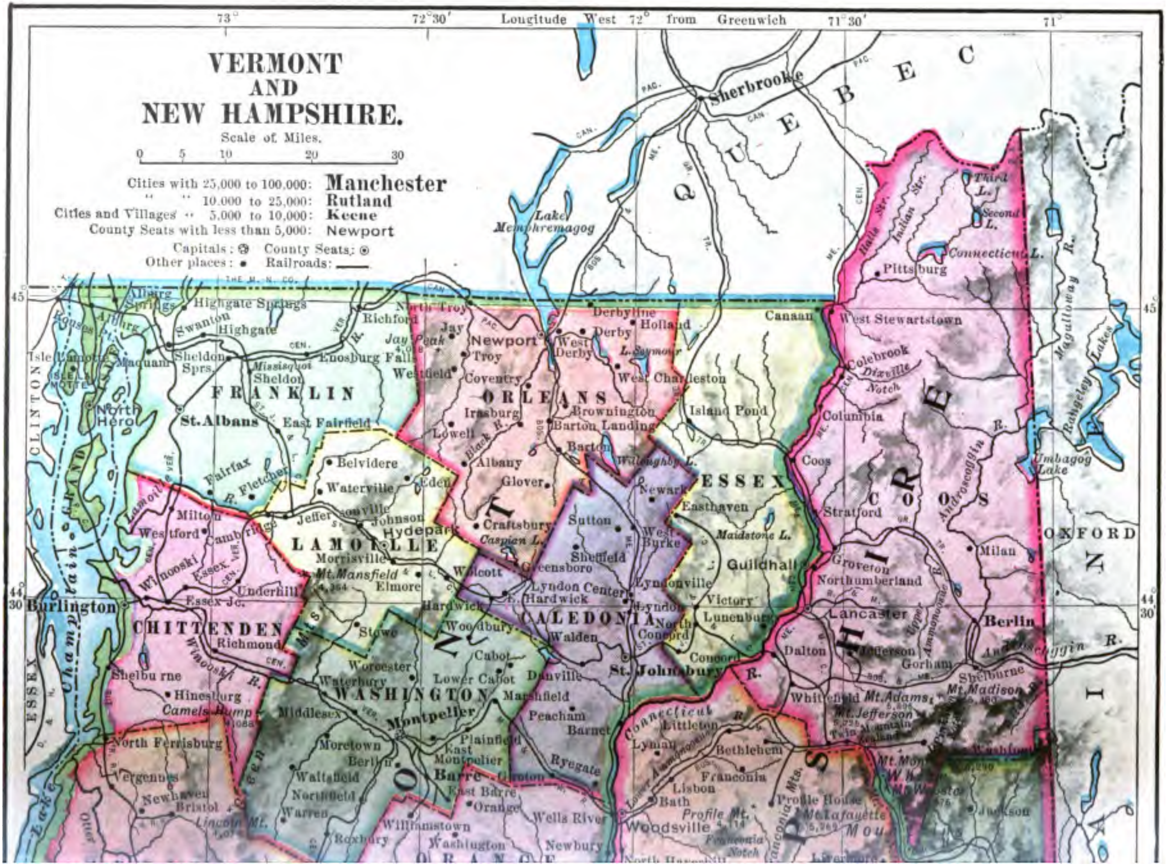
lot, Contoocook, Suncook, and Sugar rivers there are small manufacturing plants producing woollen and cotton cloth, machinery, cutlery, shoes, and other goods. There are many small lumber mills which work up the timber cut on the upland and mountains. In addition to lumber a great variety of wooden wares — furniture, chairs, pails, rakes, bobbins, shoe pegs, etc. — are manufactured.

FIG. 53.

Upland of southern New Hampshire, north from Crotchett Mountain.

There are granite quarries in many towns, but those most worked are near the railways, notably at CONCORD and MILFORD. The "redstone" quarries of CONWAY are the largest. The mica mines of southern Grafton County are the most important in the United States.

Towns like CLAREMONT and LEBANON, situated where tributaries join the Connecticut, combine the advantages of good soil, water power on the tributary stream, and the trade of villages on the valley roads. The city of


VERMONT
AND
NEW HAMPSHIRE.
Scale of Miles.
0 5 10 20 30
Cities with 25,000 to 100,000: Manchester
" " 10,000 to 25,000: Rutland
Cities and Villages " 5,000 to 10,000: Keene
County Seats with less than 5,000: Newport
Capitals: County Seats:
Other places: Railroads:
Longitude West 72° from Greenwich
73°
72°30′
71°30′
71°
45°
44° 30′
QUEBEC
Sherbrooke
Lake Memphremagog
FRANKLIN
ORLEANS
LAMOILLE
CALEDONIA
ESSEX
WASHINGTON
CHITTENDEN
CLINTON
ESSEX
OXFORD
COOS
Burlington
St. Albans
Montpelier
Newport
St. Johnsbury
Barre
Guildhall
Lancaster
Berlin
Pittsburg
West Stewartstown
Colebrook
Dixville Notch
Columbia
Stratford
Groveton
Northumberland
Milan
Gorham
Shelburne
Jefferson
Dalton
Whitefield
Littleton
Bethlehem
Franconia
Lisbon
Bath
Woodsville
Lyman
Profile House
Jackson
Mt. Adams
Mt. Jefferson
Mt. Madison
Mt. Lafayette
Connecticut L.
Second L.
Third L.
Umbagog Lake
Rangeley Lakes
Magalloway R.
Androscoggin R.
Connecticut R.
Canaan
Derby Line
Holland
Derby
West Derby
L. Seymour
West Charleston
Island Pond
Brownington
Barton Landing
Barton
Willoughby L.
Coventry
Troy
North Troy
Jay
Jay Peak
Westfield
Irasburg
Lowell
Albany
Glover
Craftsbury
Caspian L.
Greensboro
Newark
Sutton
West Burke
Sheffield
Lyndon Center
Lyndonville
Lyndon
Hardwick
E. Hardwick
Wolcott
Walden
North Concord
Concord
Victory
Lunenburg
Easthaven
Maidstone L.
Danville
Cabot
Lower Cabot
Marshfield
Peacham
Barnet
Ryegate
Groton
Plainfield
East Montpelier
East Barre
Orange
Wells River
Newbury
Williamstown
Washington
Roxbury
Northfield
Waitsfield
Warren
Moretown
Berlin
Middlesex
Waterbury
Worcester
Woodbury
Stowe
Elmore
Mt. Mansfield
Morrisville
Hyde Park
Johnson
Jeffersonville
Cambridge
Waterville
Belvidere
Eden
Fletcher
Fairfax
East Fairfield
Enosburg Falls
Richford
Sheldon
Sheldon Sprs.
Highgate
Highgate Springs
Swanton
Alburg Springs
Alburg
Isle La Motte
North Hero
Grand Isle
Milton
Westford
Essex
Winooski
Underhill
Essex Jc.
Richmond
Shelburne
Hinesburg
Camels Hump
North Ferrisburg
Vergennes
New Haven
Bristol
Lincoln Mt.
Lake Champlain
Winooski R.
Lamoille R.
Missisquoi
Black R.
Otter

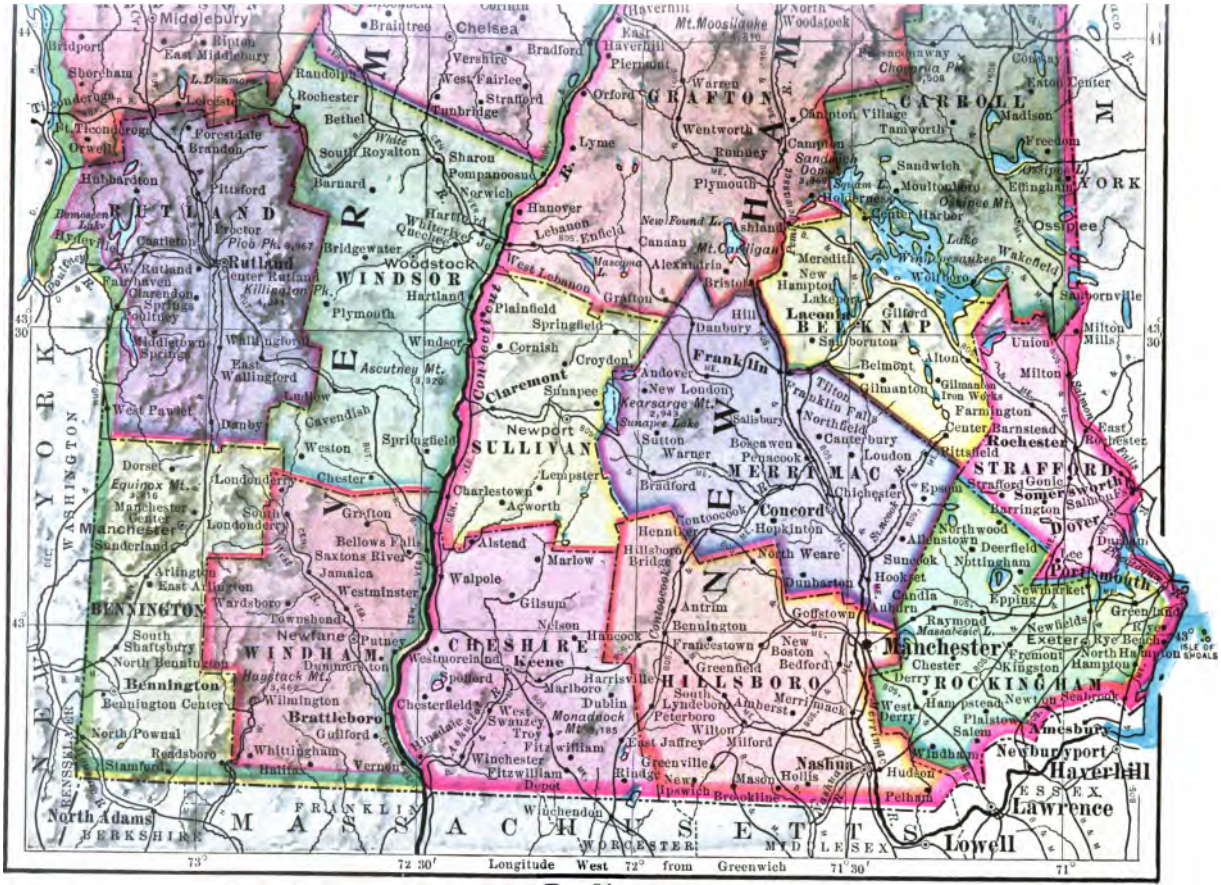

VERMONT
NEW HAMPSHIRE
NEW YORK
MASSACHUSETTS
RUTLAND
WINDSOR
WINDHAM
BENNINGTON
ORANGE
GRAFTON
CHESHIRE
SULLIVAN
CARROLL
BELKNAP
MERRIMAC
HILLSBORO
STRAFFORD
ROCKINGHAM
Middlebury
Braintree
Chelsea
Bridport
Ripton
East Middlebury
Shoreham
Vershire
Bradford
Haverhill
Mt. Moosilauke
Woodstock
Randolph
West Fairlee
Pierrepont
Warren
Orford
Conway
Eaton Center
Rochester
Strafford
Tunbridge
Wentworth
Campton Village
Tamworth
Madison
Ticonderoga
Bethel
Lyme
Campton
Freedom
Orwell
Forestdale
Brandon
South Royalton
Sharon
Pompanoosuc
Norwich
Runney
Sandwich
Ossipee
Hubbardton
Barnard
Hanover
Plymouth
Moultonboro
Effingham
Pittsford
Hartford
Whitelaw
Quechee
Lebanon
Enfield
Center Harbor
Castleton
Proctor
Pico Ph.
Bridgewater
Woodstock
Canaan
Alexandria
Meredith
Wolfeboro
Wakefield
Rutland
Center Rutland
Killington Pk.
Hartland
Plainfield
Springfield
Bristol
New Hampton
Lake Pk.
Gilford
Laconia
Sanbornville
Fairhaven
Clarendon
Springs
Poultney
Plymouth
Danbury
Union
Milton Mills
Middletown Springs
Whitingham
Windsor
Cornish
Croydon
Andover
Belmont
Alton
Wallingford
Claremont
Sunapee
New London
Gilmanton
Milton
Ludlow
Ascutney Mt.
Franklin
Tilton
Franklin Falls
Gilmanton Iron Works
West Pawlet
Danby
Cavendish
Newport
Kearsarge Mt.
Sunapee Lake
Northfield
Farmington
Center Barnstead
Rochester
Weston
Springfield
Sutton
Salisbury
Canterbury
Loudon
Pittsfield
East Rochester
Dorset
Equinox Mt.
Londonderry
Chester
Warner
Boscawen
Penacook
Epsom
Strafford
Somersworth
Manchester Center
Charlestown
Lempster
Bradford
Chichester
Barrington
Dover
Manchester
Sunderland
South Londonderry
Grafton
Acworth
Concord
Hopkinton
Northwood
Deerfield
Durham
Bellows Falls
Saxtons River
Alstead
Marlow
Hillsboro Bridge
North Weare
Allenstown
Nottingham
Lee
Portsmouth
Arlington
East Arlington
Jamaica
Walpole
Dunbarton
Sunapee
Hooksett
Newmarket
Epping
Bennington
Wardsboro
Westminster
Gilsum
Antrim
Goffstown
Candia
Auburn
Raymond
Greenland
Townshend
Nelson
Bennington
Massabesic L.
Newfields
Rye
Rye Beach
South Shaftsbury
Newfane
Putney
Hancock
Francestown
New Boston
Bedford
Exeter
North Bennington
Dummerston
Keene
Greenfield
Manchester
Fremont
North Hampton
Bennington
Haystack Mt.
Westmoreland
Harrisville
Chester
Kingston
Hampton
Bennington Center
Wilmington
Spofford
Marlboro
Dublin
Lyndeborough
Derry
Hampstead
Newton
Seabrook
Brattleboro
Chesterfield
Swanzey
Monadnock Mt.
Peterboro
Amherst
Merrimack
West Derry
Plaistow
Amesbury
North Pownal
Guilford
Troy
Wilton
Salem
Readsboro
Whittingham
Fitzwilliam
East Jaffrey
Milford
Windham
Newburyport
Stamford
Halifax
Vernon
Winchester
Greenville
Nashua
Hudson
Haverhill
Fitzwilliam Depot
Ridge
Mason
Hollis
Pelham
ESSEX
North Adams
BERKSHIRE
FRANKLIN
Winchendon
Lawrence
WORCESTER
MIDDLESEX
Lowell
Longitude West from Greenwich
73°
72° 30'
72°
71° 30'
71°

FIG. 54.

KEENE has similar advantages, where several valleys centre in the basin of the Ashuelot River. Other thriving towns are NEWPORT, near Claremont, and MILFORD, near Nashua. HANOVER is the seat of Dartmouth College, an old and important institution.

While the White Mountains are peculiarly characteristic of New Hampshire, other parts of the state are closely related to the adjacent sections of adjoining states. The northern part resembles central Maine; the industries of the Piedmont district and the southern uplands are like those of the neighboring portions of Massachusetts; and the western central section shares in the agricultural interests of Vermont. The towns reaching back from the fertile terraces of the Connecticut valley have fine dairy farms, and over half the creameries of the state (p. 102) are near the Vermont border, mainly in the line of valley towns from CLAREMONT to LANCASTER. The upland towns produce much maple sugar and syrup (p. 103).

VERMONT

Agriculture. — Agriculture is the most important industry of the "Green Mountain State," for manufacturing is less developed there than near the seacoast, where transportation of supplies and products has long been easy. The entertainment of summer boarders in towns favorably situated on lake shores or among the mountains is an important industry of Vermont (p. 28).

The rugged and forested highlands of the Green Mountains form a belt ten or twenty miles wide at the south, and separated into two ranges at the north (Fig. 4), like the letter Y. Mt. Mansfield and several other well-known peaks rise over four thousand feet above sea level. The upland of central and northwestern Vermont, from which

these mountains rise, is better tilled and occupied than most upland districts of New England. The best farms, however, are in the valleys, some of the more fertile soils being on the terraces (p. 10) of the Connecticut valley. On the west is the broad lowland in which lies Lake Champlain, and which extends from Canada southward to the Hudson valley. Throughout the level lands which border the shores of this lake and extend up the Otter Creek valley, the farms are large, and the clayey soil yields abundant crops of grain and hay. Apples and other fruits bring large returns, for the westerly winds from over the lake tend to prevent early frosts.

Since Vermont has few cities, and the smallest population of any New England state (pp. 123 and 128), her farm products must find a market abroad, to make return for the manufactured goods purchased. In early times the crops were fed to large flocks of sheep, and wool was exported; but to-day butter and cheese are the leading products. These interests have given origin to stock farms. The Merino sheep and Morgan horses raised in the Otter valley won a high reputation in the past. While the number of Vermont sheep has decreased to one-fifth of the former total, the Merino blood has so improved them that an average fleece weighs three times as much as in former days. Driving horses are again being carefully bred on some Vermont farms. A considerable use of thoroughbred dairy stock (p. 45) has so improved the cattle of the state that the average yield of butter per cow is somewhat larger than in any other state.

Dairying. — Not long ago the old-fashioned dasher churn (Fig. 55) and the wooden cheese press were as common on farms as the spinning-wheel and loom in still earlier times;

but to-day nearly all the cheese is made in cheese factories, and much butter in the creameries. Improved processes and machinery, under expert care, produce butter and cheese of high excellence, which command a higher price in the open market than similar products gathered from small farms.

FIG. 55.
Making butter on the farm. What is the use of each object in the picture?

There are some seventy cheese factories in the state, mainly in its southern third, and nearly two hundred creameries. The Franklin County creamery (Fig. 57) at ST. ALBANS is one of the largest in the world, making at times more than ten tons of butter in a day. To supply this creamery there are many skimming stations in the vil-

FIG. 56.
A Franklin County skimming station.

lages for miles around. To these the farmers bring their milk to be skimmed, and the cream is sent by train or wagon to the creamery.

When milk is placed in shallow pans in a cool place, or in deep, narrow cans in cold water, the light *globules of fat* slowly rise as *cream*. More cream, however, is secured by the use of *separators*, and the separation takes place at once. In these machines a stream of milk enters a rapidly revolving metal bowl, having two outlets, one from near the centre for the cream, another for the heavier *skim milk*, which is forced toward the outside because of the rapid revolution. The cream is then set in cold water for some hours in order that the butter may be firm; and after this the temperature is slowly raised to ripen or sour the cream enough to flavor the butter. The cream is placed in the great revolving churns of the creamery, in which the fat particles become united into little masses of butter. The blue, watery *buttermilk* is then drawn off, and the butter is twice rinsed in clear water. After this the butter is worked about in a machine to press out most of the water and to flavor it evenly with salt. It is then moulded into "prints" or packed in wooden tubs.

FIG. 57.
Creamery, St. Albans. Rotary churns.

Cheese contains the curd as well as the fat, and these together amount to about half of the solids of milk. The *casein* or *curd* is an albuminous substance, like lean meat, held in solution in the fresh milk. Most of the water is removed in cheese manufacture, leaving the cheese composed of about a third each of water, fat, and casein. When thus condensed, the milk solids may be readily preserved and transported.

The Forests. — Lumbering is a leading occupation in the northeastern counties. In this section forests cover much of the upland, as they do across the border in Canada and New Hampshire. NEWPORT on Lake Memphremagog is a centre for the lumber trade. Small mills in many towns raise the sum total of manufactures of wood in Vermont to a value of over four million dollars. Sawmill machinery is made in MONTPELIER. Very many farms have orchards of sugar maples, and Vermont produces more and better maple sugar than any other state.

In late winter, when the warm sun starts the sap, the maples are tapped with small augers, and the sap which flows forth is collected. It is then boiled down until enough water has evaporated for the sugar to crystallize as the syrup cools. Formerly the sap was caught in wooden troughs, collected by men on snow-shoes, and boiled in iron kettles over open fires, yielding dark, dirty sugar. Now the sap is drawn from the woods on tank sleds, or is conducted through lines of piping, to comfortable sugar houses. Here it is rapidly boiled in covered evaporators, giving clean and toothsome syrup and sugar.

Quarries. — The expansion of railways along the valleys of Vermont has led to the development of quarrying and some manufacturing, by affording an outlet for products. In Rutland County a belt of slate rocks extends southward from FAIR HAVEN to POULTNEY, and westward into New York State. The Vermont quarries produce more

slate (p. 108) than those of any other state except Pennsylvania. Some of the green slate contains so little iron oxide that it does not turn brown on exposure to the air, and much of this is exported to other continents.

Crossing the Taconic range from the slate belt, one comes to the limestone and marble formation that extends northward along the Otter and Champlain valleys. Vermont produces more marble than any other state, and nearly all that is used for monuments. Quarries were opened soon after the Revolution, and over half the marble used in the country since that time has come from Vermont. RUTLAND is the business centre of the industry, and the most important quarries are in neighboring towns, such as WEST RUTLAND, PROCTOR, and BRANDON.

The marble quarries are deep rectangular pits. On their level floors are movable railways on which are channelling machines for cutting long, deep grooves in the marble floor by blows of vertical chisels. Series of holes are then drilled by another machine, marking off the stone into blocks, which are separated by the use of iron wedges, since blasting would injure the marble. At the mills the blocks are sawed into slabs. For this purpose, sand, borne by a stream of water, is ground against a block of marble by means of strips of soft iron, held in a frame and moved back and forth with their edges on the stone. This wears narrow grooves that finally divide the blocks into slabs. With the aid of sand, other machines turn and shape, smooth and polish, the marble, much as wood is moulded and finished for use.

Beautiful variegated and black marbles are quarried in the northwestern corner of the state, but they are so hard that it costs more to shape and polish them. Limestone is quarried in some places for building purposes, or is burned for lime.

Granite of varying color and texture is quarried in a number of Vermont towns, and BARRE now leads all

other places in the production of fine granite for monuments. Much granite is exported in rough blocks to be wrought in other states. Besides the workmen in the quarry villages about Barre, more than fifteen hundred skilled men are engaged in cutting and polishing monuments and blocks at the many extensive works in the city.

Cities. — BURLINGTON, on Lake Champlain, the largest city of the state, has developed as a central lake port. At first the goods received from steamers and by canal boats from the Hudson and St. Lawrence valleys were sent from Burlington to the towns farther east in great eight-horse wagons. Afterwards railways were built from the lake up the Otter, Lamoille, Winooski, and Missisquoi valleys, and over the divide to the Connecticut valley.

Lumber from Canada is brought to Burlington to be planed and cut for use, and the city is one of the large lumber markets of the country. Some of the lumber is here made into doors, sashes, blinds, shade rollers, and furniture. The city is an important trade centre for the country round about, with large wholesale and retail stores; and naturally (p. 65) there are varied manufactures, notably of machinery, shoes, and patent medicines. The water power of the Winooski River is used by woollen mills in the village of Winooski and by cotton mills in Burlington. The city has fine public buildings and residences, which command beautiful lake and mountain views. It is the seat of the University of Vermont.

To the north is ST. ALBANS, a leading butter market, and the seat of manufacturing interests. The offices and shops (p. 62) of the Central Vermont Railway are located there. MONTPELIER, the state capital, is farther east in the Winooski valley; and nearby is BARRE. Each city has

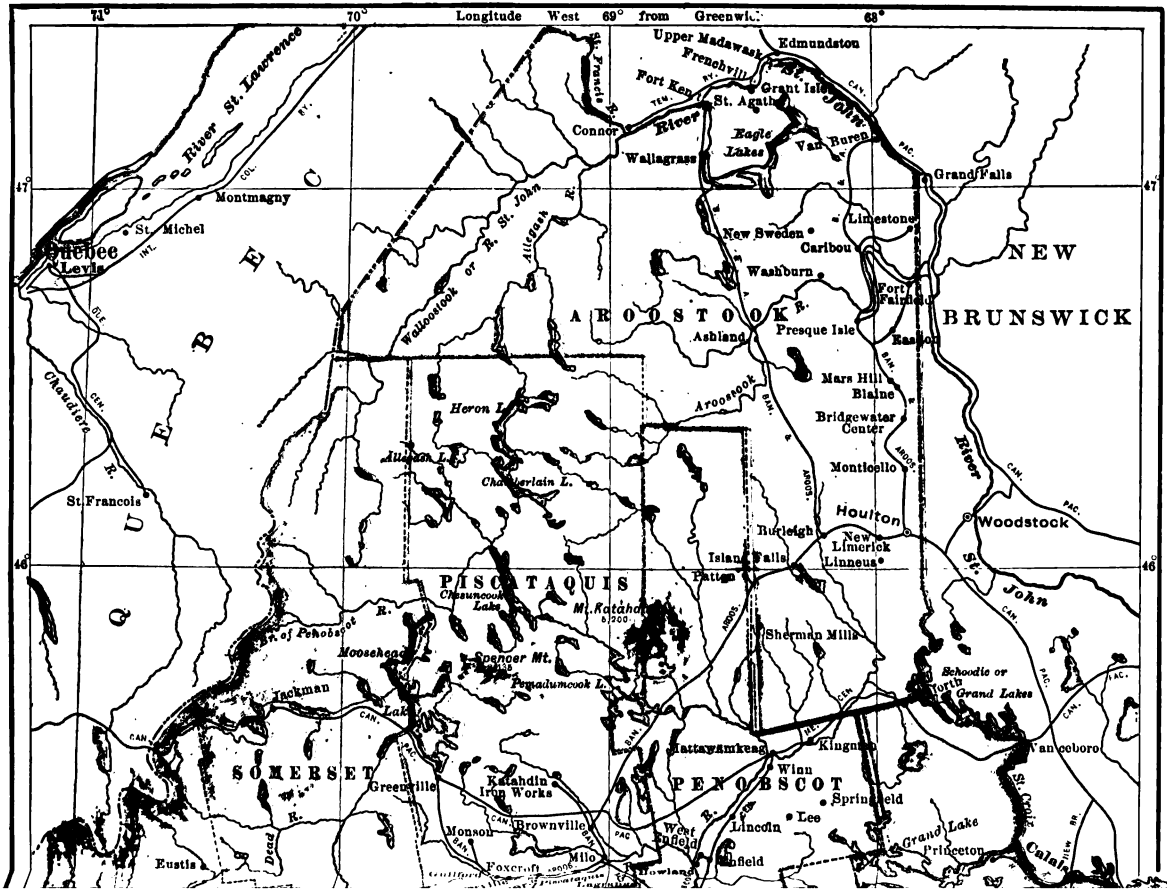
water power which is used by several factories. NORTHFIELD is the seat of Norwich University. To the south, factories in RUTLAND produce weighing scales, car wheels (p. 61), and farm tools. The sixth city of the state, and both the oldest and smallest city of New England, is VERGENNES. When, in early days, most of the population was in southern Vermont, it was an important trading point, because it was situated at the head of lake navigation on Otter Creek. MIDDLEBURY is the seat of Middle-

FIG. 58.

Montpelier. Find the Capitol. Describe the situation of the city.

bury College. The historic town of BENNINGTON, with its battle monument, is still farther south. Some of its people are employed in hosiery mills.

There are several important manufacturing towns in eastern Vermont. ST. JOHNSBURY has the largest scale works in operation anywhere, and Vermont scales are the standard in many countries. There are a number of small woollen mills (p. 54) and other factories in towns on tributaries of the Connecticut River. At BELLOWS FALLS the water power of the main river is used in manufacturing paper, machinery for creameries, farming machinery, and



Longitude West 69° from Greenwich
71°
70°
68°
47°
46°
River St. Lawrence
Quebec
Levis
St. Michel
Montmagny
QUEBEC
St. Francois
Chaudiere R.
Upper Madawaska
Frenchville
Edmundston
Fort Kent
St. Agatha
Grant Isle
St. John
River
Connor
Wallagrass
Eagle Lakes
Van Buren
Grand Falls
St. Francis R.
Walloostook or R. St. John
Allegash R.
New Sweden
Caribou
Limestone
Washburn
Fort Fairfield
NEW BRUNSWICK
AROOSTOOK
Ashland
Presque Isle
Easton
Mars Hill
Blaine
Bridgewater Center
Aroostook
Heron L.
Allegash L.
Chamberlain L.
Monticello
Houlton
Woodstock
Burleigh
New Limerick
Linneus
Island Falls
Patten
PISCATAQUIS
Chesuncook Lake
Mt. Katahdin
Sherman Mills
Schoodic or Grand Lakes
North
Moosehead
Spencer Mt.
Pemadumcook L.
Jackman
Lake
Hattawamkeag
Kingman
Vanceboro
SOMERSET
Greenville
Katahdin Iron Works
PENOBSCOT
Winn
Springfield
Lee
Lincoln
Brownville
Monson
West Enfield
Enfield
Grand Lake
Princeton
St. Croix
Calais
Eustis
Dead R.
Foxcroft
Milo
Howland

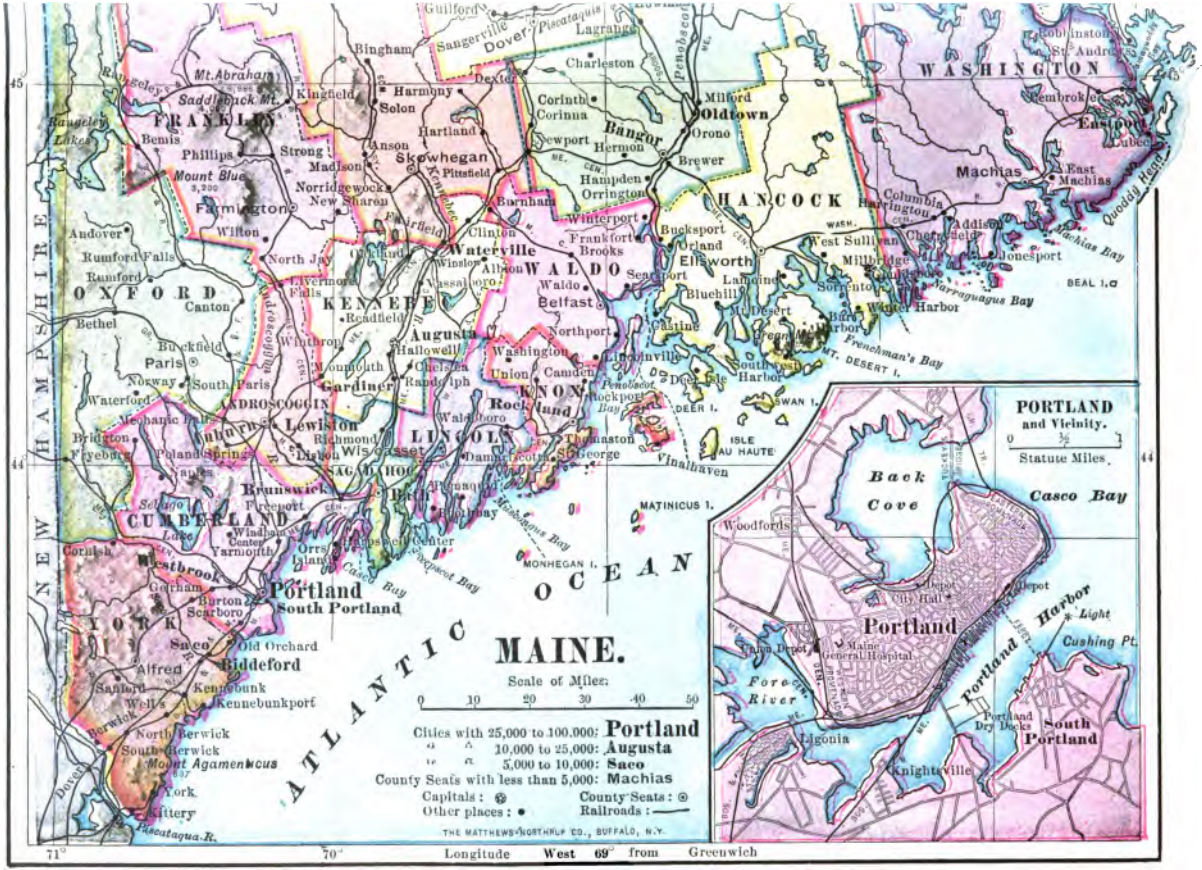

MAINE.
Scale of Miles:
0 10 20 30 40 50
Cities with 25,000 to 100,000: Portland
10,000 to 25,000: Augusta
5,000 to 10,000: Saco
County Seats with less than 5,000: Machias
Capitals: ⊛ County Seats: ⊙
Other places: • Railroads: —
THE MATTHEWS-NORTHRUP CO., BUFFALO, N.Y.
ATLANTIC OCEAN
NEW HAMPSHIRE
FRANKLIN
OXFORD
KENNEBEC
SOMERSET
PISCATAQUIS
PENOBSCOT
WASHINGTON
HANCOCK
WALDO
KNOX
LINCOLN
SAGADAHOC
ANDROSCOGGIN
CUMBERLAND
YORK
PORTLAND and Vicinity.
Statute Miles.
Back Cove
Casco Bay
Portland Harbor
Fore River
Cushing Pt.
Longitude West 69° from Greenwich

FIG. 59.

other goods. The trade centre of BRATTLEBORO, with its great manufactory of reed organs, has developed at the point where West River joins the Connecticut River.

MAINE

Central and Eastern Maine. — Maine, the "Pine Tree State," has one-half the area but only one-eighth the population of New England. Much of the northern and eastern sections, covered by a vast forest, are uninhabited.

In the great mills, on the falls of the large rivers, pulp and chemical fibre for paper, boards and beams, shingles and laths, and other like products, are manufactured from spruce and pine (pp. 38–42). BANGOR, the third city of Maine in size, and the neighboring places of BREWER, OLDTOWN, and ORONO, receive the lumber floated down the Penobscot, convert it into varied products in wood and paper, and ship them away by water and rail. There are other secondary interests in these places, such as the manufacture of shoes, machinery, and woollen cloth. CALAIS, with like industries, is similarly placed on the St. Croix River. The same manufactures are also prominent at the seaports of BELFAST and ELLSWORTH in eastern Maine. The University of Maine is at ORONO.

There are many mills along the little streams of the upland in which both hard and soft wood are sawed and turned into small articles and novelties. There are large wood novelty works at FARMINGTON and PARIS in western Maine. The varied products of these mills include such articles as furniture, sleds, druggists' boxes, handles, toys, clothes-pins, checkers, toothpicks, and bicycle rims. Woollen mills (p. 54) are found in some towns; for instance, at DEXTER and at villages on the Piscataquis River. Besides valuable granite quarries on the

upland and in its valleys, there are fine slate quarries in several towns of Piscataquis County, producing roofing slate and slabs of rough stone for mill stock. In the slate mill at PORTLAND these are sawed, planed, drilled, and shaped for use as interior finish and furniture for buildings.

Fifty miles back from the coast there is a belt of country producing much fine white birch wood, many thousands of

FIG. 60.
Hunters' camp in the Maine woods.

cords of which are used yearly for spools. Spool wood is sawed into square strips, or bars, and then left in piles to dry. These strips are fed into automatic machines, which quickly turn them into spools of exact size. Nearly half of the spool bars are shipped from Portland and Bangor to Scotland, where they are made into spools.

Mountains rise above the rugged upland, and from their summits one may see the many lakes of the wilderness, gleaming like silver amid the dark forests. There are many deer and moose and a few caribou in these wild lands. The deer and moose are protected most of the year by state laws, and

the shooting of caribou has been prohibited for several years. During the open season, in the fall, thousands of sportsmen from the cities spend a week or more at camps on remote lakes, enjoying the crisp air, the beauty of the woodlands, and the excitement of hunting big game. Nearly two thousand men are registered as guides, and many taxidermists are employed in preparing skins, heads, and antlers as trophies.

The lakes and streams, well stocked with trout and other fish, attract many anglers. With guides, they often take long canoe trips, — for example, through the lake district of Washington County, or down the west branch of the Penobscot from the "carry" at the head of Moosehead Lake.

FIG. 61.
A doe in winter.

The northern boundary of Maine was not determined exactly until 1842, and that part of the state was not directly connected with southern Maine until quite recently, when the Bangor and Aroostook railway line was built. This section has still some characteristics of the frontier, for, unlike the rest of agricultural New England, it is increasing in population, as new land in the valleys is cleared and cultivated. The loose, open soil of glacial drift is easily tilled, and the gently rolling surface allows the use of farm machinery. Wheat and other grains are raised and flour is made in local grist mills; but potatoes are the principal farm product in Aroostook County.

The potatoes are planted, cultivated, and dug by machines drawn by horses. The best potatoes are usually sold for food, or to be used as seed potatoes in other states; but the smaller ones are taken to the starch factories. There the potatoes

pass through machines which wash them and grate them to pulp. The starch granules are washed from the pulp into tanks, where they are allowed to settle. After another washing, the white starch is thoroughly dried, and later barrelled for sale. Potato starch is used as sizing for giving a smooth, firm surface to warp yarns and to cloth.

Railways have led to the growth of towns as trading and manufacturing centres for the agricultural lands of the valleys and the lumber camps of the upland. The more important are HOULTON at the south, and CARIBOU, FORT FAIRFIELD, and PRESQUE ISLE in the Aroostook valley. Many sparsely settled townships are organized as plantations, but do not have the full powers of towns.

Southwestern Maine. — The southwestern section presents a marked contrast to the rest of the state. This corner of Maine has long been settled. It contains half the population of the state, and most of the cities and large towns (Fig. 15). PORTLAND has a large, deep, and safe harbor on Casco Bay, and is by far the largest city of the state. It is a port for steamships which transport grain, cattle, and other products, received from one of the Canadian railways, to Liverpool. Steamship lines connect Portland with the leading American coast cities, and the railways radiate to the manufacturing cities and towns at the falls of the large rivers of Maine (p. 21). Like all important trade centres, Portland has varied manufactures (p. 65). Here are the largest foundries and machine shops in Maine, making engines and machines for lumbering, pulp making, ice cutting, quarrying, shipbuilding, farming, and other industries of the state. Half their product is sent to other parts of the country. Although Deering has been annexed to Portland, the adjoining

manufacturing cities of SOUTH PORTLAND and WESTBROOK still have separate governments.

There are important paper and lumber mills in this section (p. 42), but the leading manufactures in most of the cities, as in those of the low coastal districts of the other New England states, are textile goods, shoes, and machinery. In York County the cities of BIDDEFORD and SACO, at the lowest falls of the Saco River, have large cotton mills and other manufacturing interests. In the town of SANFORD are important plush, worsted, and alpaca mills. North of Portland on the Androscoggin River, where falls afford good water power, is LEWISTON, with its great cotton mills and their related bleacheries and dye works (p. 52). AUBURN, the shoe city of Maine, is opposite to Lewiston. In each city there are other manufactures, such as the making of woollen cloth in Lewiston and of agricultural implements in Auburn. Bates College is at Lewiston. BRUNSWICK, with its cotton mills and pulp mill, is situated where falls of the river enter tidewater. It is the seat of Bowdoin College, the oldest college in the state. There are woollen mills at LISBON. Other manufacturing villages, such as RUMFORD and JAY, are above Lewiston on the Androscoggin.

AUGUSTA, the state capital, has the advantage of water power and a waterway to the ocean (p. 23), and is the largest city on the Kennebec River. Besides being a trade centre for the valley, it has both cotton and paper mills. There are other manufacturing communities along the Kennebec, with varied products. WATERVILLE, SKOWHEGAN, and FAIRFIELD are above Augusta, while GARDNER and HALLOWELL are on tide water. Waterville is the seat of Colby University.

Agriculture is the leading industry in the many thinly populated towns south of the forests of Maine. Near the cities milk, butter, vegetables, and other farm products find ready sale. Farther into the country there are many creameries, producing cream and butter, and some cheese factories (p. 102). Famous horses have been reared on Maine stock farms, and the business is now a profitable one. Sheep are often kept for their mutton and wool. There are large orchards on many farms, and fine winter apples are exported. Much farm produce is canned for sale. There are about seventy canneries, which pack many thousand cases of apples, blueberries, squashes, and other produce. More corn is canned in Maine than in any other state except New York and Illinois.

The owners of canneries sell seed corn to the farmers, and agree to buy their crop of sweet corn at a certain price. In the early fall the ears are carted to the canneries, where all who wish may share in the work of husking. Machines are used to cut off the milky kernels. These are sweetened, cooked, and placed in cans, which are sealed while yet steaming. The cans of corn are cooked again in steam retorts, cooled, labelled, and packed in boxes for sale.

Coast. — South of Portland the coast is but slightly indented, and the sandy beaches of OLD ORCHARD, YORK, and other towns are well-known summer resorts. From Casco Bay eastward the coast line is very irregular, and many lighthouses are needed to warn ships away from the rocky islets and reefs. Fishing, shipbuilding, and commerce once brought prosperity to most towns on the islands and long peninsulas; but conditions have changed here, as on the uplands, and the census of 1900 showed a decrease in population for most places in the four coast

counties of Lincoln, Knox, Waldo, and Hancock. However, the little steamers that thread the channels among the islands bring many summer residents to this bold, picturesque coast, and some places have become prosperous through supplying the wants of cottagers and boarders. BAR HARBOR on Mount Desert Island is a famous resort, and many points from the islands of Casco Bay to Calais share the popular favor. Summer boarders also frequent the interior towns of Maine, and this state, like New Hampshire (p. 94), celebrates "Old Home Week."

As the industries of the coast towns have become centred at places with good railway connections, many of the young people have sought work in the larger cities. Once every coast village sent schooners to the fishing banks; now they sail only from Portland and a few small ports. The shore fisheries of Maine, however, have increased in importance, and more than seventy factories are engaged in canning small herring, lobsters, and clams. Many of the canning factories are at EASTPORT and LUBEC on Passamaquoddy Bay.

FIG. 62.

A fisherman, dory, and lobster pots.

In Europe little fishes have long been canned as sardines, and since 1875 the industry has developed here. When herring are feeding they swim at the surface of the tidal currents,

and may be caught in *weirs*. These are closely woven brush fences built out from the shore to direct the fish toward a netted enclosure in which they are entrapped. There they swim about in circles until dipped out at low tide. Small steamers collect the catch, and the factory whistles call men, women, and children to the work of cleaning and canning the fish while fresh. The cleaned fish are soaked in brine, dried on wire flakes, cooked in hot oil for two or three minutes, and packed in oil in small tin boxes. Often the fish are quickly dried and cooked in the hot air of ovens. Somewhat larger herring are packed in mustard, and full-grown fish are smoked.

BATH is the shipbuilding city of Maine. Its deep, safe harbor received the lumber for vessels from both the Kennebec and Androscoggin rivers, and the energy of its citizens has developed two plants for the building of steel ships, notwithstanding the distance from coal and iron. War ships are built, as well as steamers, schooners, and barges for the coasting trade. Not only here and at CAMDEN, but also at ROCKLAND, BELFAST, WALDOBORO, and other deep harbors, the industry has revived.

The location of granite quarries, lime kilns, and brickyards along the coast is important, since the products may be easily shipped to the great coast cities. The deposits of glacial clays (p. 10) are extensive, and formerly brick was largely exported. Quarries at HALLOWELL, VINAL HAVEN and other points furnish much granite for buildings and paving stones. The inexhaustible limestone beds in ROCKLAND and adjoining towns have been worked for two centuries, and the lime produced exceeds in value the total output of any other state.

Great changes in the methods of quarrying and burning lime, brought about by sharp competition, have resulted in giving a cheaper and better product. Once the rock was drilled by

hand, blasted with powder, hauled to the kilns in ox carts, and burned for several days with wood. Now power drills, run by compressed air, prepare the holes for the dynamite used. The rock is raised on electric cable ways to cars that run to the kilns at the wharves. By the use of soft coal and a forced draft, the lime is burned in modern kilns in a single day.

Ice is another export from the coast section. The winters of Maine are so long and cold that thick ice forms in the estuaries, and on the lakes near the coast, whence it may be profitably exported in vessels.

The large rivers contain fresh water far below the point where the tides rise in their drowned valleys. During the ice harvest, several thousand men and many horses are busy on the Kennebec and Penobscot rivers. The loose snow is easily removed, but that which is frozen to the ice has to be planed off. The clear ice is then grooved into square blocks, which are floated to the great storehouses. Here they are raised on inclined ways by steam power and packed away. The ice houses have been purchased by the company which supplies ice to New York and Philadelphia.

REVIEW QUESTIONS

PHYSIOGRAPHY AND CLIMATE.— (1) State the position of the New England States. (2) State their area. (3) What about their population? (4) Describe the relief. (5) Relate the history of the upland. (6) Describe the valleys. (7) Describe the mountains. (8) How are relief and population related? (9) Describe the lowland basins and their formation. (10) Compare the New England upland and the southern Piedmont. (11) Describe the glacial moraines. (12) Describe the glacial soil. (13) Tell about drumlins. (14) Tell about sand plains. (15) How did the glacier affect the drainage? (16) How were the terraced plains and the associated falls formed? (17) Why are the falls of New England important? (18) State the character of the coast and its effect on industries. (19) Tell the story of coast formation. (20) Describe the more recent changes. (21) What does our government do on the coast to aid commerce? (22) Give an account of New England temperatures, with causes and effects.

(23) Describe the effects of cyclonic storms on the weather. (24) What is the characteristic summer weather?

SOCIAL AND INDUSTRIAL DEVELOPMENT. — (1) Tell the story of the settlement of New England. (2) Describe the character of the settlers. (3) What led to the formation of several colonies? (4) What were the steps in the extension of the frontier? (5) Describe life on the frontier. (6) Give an account of the beginnings of commerce. (7) What seaports rose to importance? Why many? (8) Sketch the development of shipbuilding. (9) What effect had the building of railways on seaports? (10) Why were factories built? With what effect on population? (11) Relate the causes leading to the growth of manufacturing cities like Lowell. (12) Like Salem. (13) Hartford. (14) Fall River. (15) Worcester. (16) Meriden. (17) Tell the story of the extension of railways and their relation to relief of the land. (18) Tell about the combination of the railways. (19) What are some of the causes and effects of the decrease of population on the uplands? (20) What influences are bringing prosperity to some country districts? (21) Describe the development of roads. (22) Describe state roads. (23) What effects has the summer vacation system had on country towns? (24) Tell about the races that have come to New England cities. (25) Describe city tenement life. (26) What did the settlers do for education? (27) Give an account of the district schools and academies. (28) What has been done to improve the school system in recent years? (29) Of what value is free education to New England?

INDUSTRIES. *Fishing.* — (1) Speak of the importance of the fisheries. (2) Recount the development of the industry. (3) At what ports does it centre? (4) Tell about the coast summer resorts. (5) Describe the method of catching cod and halibut. (6) Tell about their preparation for market. (7) Describe the life of a fisherman. (8) How are mackerel caught?

Lumbering. — (9) Contrast the woodlands of southern New England in colonial days and now. (10) Give an account of the Maine forest and its value. (11) Describe the methods of logging. (12) Tell about the life of the lumbermen. (13) Describe driving. (14) What are the principal lumber products? (15) Tell about centres of lumber manufacture. (16) The methods of manufacture. (17) The shipment of lumber. (18) How is paper made from wood? (19) How important is this industry? (20) Where are pulp mills placed?

Agriculture. — (21) Contrast the past and present importance of farming. (22) Contrast past and present methods. (23) Why

are dairy farms and market gardens so important? (24) Compare the cows of colonial days with present dairy herds. (25) How are cows fed? (26) How is milk marketed? (27) Describe the work of a market gardener in winter. (28) Describe his work in summer. (29) What are leading farm and garden products?

Quarrying. — (30) Why is quarrying important in New England? (31) For what is granite used, and why? (32) How is it quarried and cut for use? (33) Where are the most important granite quarries?

Textile Manufactures. — (34) Why was cloth made in the colonies? (35) How was it made? (36) Relate the development of textile manufacturing. (37) Relate the development of cotton manufacturing in and near Rhode Island. (38) Tell about the mill cities north of Boston. (39) What about cotton manufacturing in Fall River? (40) Name and locate the important centres of cotton manufacture. (41) What are the products of cotton mills? (42) What changes in cotton manufacturing are now continuing? (43) How is woollen manufacturing distributed, and why? (44) Where is the manufacture of worsted goods centred? (45) How do woollen and worsted goods differ? (46) What different kinds of mills are engaged in cloth manufacture? (47) Give an account of carpet manufacture. (48) Tell about cotton thread; knit goods; manufactures of linen; of silk.

Shoe Manufacture. — (49) Tell about tanning in colonial times. (50) Tell about its present distribution. (51) Describe the early manufacture of shoes; the development of the industry. (52) What has been the effect of the introduction of machinery? (53) Describe the distribution of shoe factories and centres of production. (54) Where are rubber shoes made?

Manufactures of Metals. — (55) Tell about the early iron industry. (56) Why are there no important mines here to-day? (57) What kinds of metal goods are now made here, and why? (58) Name and locate the centres. (59) Why is the manufacture of machinery important? (60) Where are different kinds of vehicles made?

Commerce. — (61) In what respects are smaller and larger centres of trade alike? (62) What different causes have led to the growth of Boston? (63) Describe its business as a wool market; a cotton market; a financial centre; a shoe and leather market. (64) Why do large trade centres have many and varied industries? (65) What foods are prepared for sale in and near Boston?

MASSACHUSETTS. — (1) What is the population of Massachusetts? (2) How is it distributed? (3) Describe the physiography of the Boston Basin. (4) Recount the growth of cities at the head of Boston

Harbor, and its causes. (5) Tell about the Metropolitan commissions. (6) Give an account of the circle of communities outside the Boston Basin. (7) Name, locate, and give important facts about the cities of the Merrimac valley. (8) Tell about Worcester and its neighbors. (9) Do the same for the cities of Bristol County. (10) For what are Plymouth and Gloucester important? (11) Tell about Cape Cod and its life. (12) Tell about whale fishing. (13) Describe the raising of cranberries. (14) Account for the distribution of population in western Massachusetts. (15) Name, locate, and tell about the important places in the Connecticut valley. (16) How is paper made from rags? (17) Tell about the towns of the central upland and its valleys. (18) Tell about places in the Berkshire valley.

RHODE ISLAND. — (1) Account for the density of population and its distribution? (2) What are the most important manufactured products? (3) Sketch the changes in the commerce of Providence. (4) Give an account of its manufactures. (5) Give an account of its suburban growth. (6) Tell about the important places and industries northward from Providence. (7) Do the same for places to the northwestward. (8) What important places and industries are found to the southwest of Providence? (9) Answer the same question for Bristol County. (10) Draw and describe Narragansett Bay. (11) Recount the changes in the interests of Newport. (12) Name the leading summer resorts. (13) Tell about the fisheries. (14) Contrast farming on the lowland with that of the uplands. (15) Contrast the people of the upland farms and those of the cities. (16) Describe southwestern Rhode Island; the surface; drainage; coast; industries; and largest towns.

CONNECTICUT. — (1) Describe the Connecticut valley lowland, and its importance. (2) Tell about agriculture on the lowland. (3) What can you say about its industrial development? (4) What is the characteristic of Connecticut manufactures? Which are most important? (5) Give an account of Hartford. (6) For what are its neighbors to the north and east important? (7) What places and industries are found to the south of Hartford? (8) Tell about New Haven, — its development, industries, and parks. (9) Describe the coast. (10) Give the leading facts about the oyster industry. (11) Name, locate, and mention important facts about the ports near Rhode Island. (12) Do the same for ports near New York. (13) Tell about the western upland and its interests. (14) Tell about the cities of the Naugatuck valley. (15) Give important facts about the manufacture of brassware. (16) For what is Danbury important?

(17) Give an account of the eastern upland and its industries. (18) Tell about Norwich and villages in the Quinebaug valley. (19) Give an account of Willimantic and Stafford. (20) What can you tell about silk production and manufacture?

NEW HAMPSHIRE. — (1) Describe the mountains of New Hampshire. (2) Describe the notches of the White Mountains. (3) Tell about the summer resorts. (4) Tell about the forests and their products. (5) Give the main facts about Berlin. (6) Describe the surface of southeastern New Hampshire. (7) What are its industries and products? (8) Tell about Portsmouth and cities near it. (9) Tell about cities on the Merrimac. (10) Give an account of the southern upland. (11) Give an account of its industries and products. (12) Name, locate, and give leading facts about its towns and cities. (13) What interest leads in the Connecticut valley?

VERMONT. — (1) What is the most important state industry? Why? (2) Describe the sections of the state and their characteristics. (3) Why are stock farms important? (4) Give an account of the dairy industry and the manufacture of butter. (5) Tell about lumbering. (6) How is maple sugar made? (7) Tell about slate; where quarried; importance. (8) Tell about marble; where quarried; importance; how quarried and worked. (9) Tell about granite; where quarried; importance. (10) Relate the development of Burlington. (11) Describe its industries. (12) Give an account of the important places in western Vermont. (13) In eastern Vermont.

MAINE. — (1) Contrast Maine and Massachusetts as to area and population. (2) Give an account of Bangor and its neighbors. (3) Locate and tell about Calais, Belfast, and Ellsworth. (4) Describe the industries of central Maine. (5) Tell about the manufacture of spools. (6) Describe the forests as a game preserve. (7) What can you tell about Aroostook County and its products? (8) Tell about the raising of potatoes and manufacture of starch. (9) Give important facts about the towns of Aroostook County. (10) Contrast southwestern Maine with the rest of the state. (11) Give an account of Portland. (12) Give an account of the leading places in York County. (13) Do the same for the leading places on the Androscoggin, and on the Kennebec. (14) Tell about Maine agriculture. (15) Tell about the canning of corn. (16) Describe the coast line of Maine. (17) Describe its past and present industries. (18) Tell about the canning of fish. (19) Give the main facts about shipbuilding; about the granite industry; about the lime industry; about ice. (20) What are the important coast towns and cities and their industries?

SUGGESTIONS

HOME GEOGRAPHY. — Study the geography of your own town or city while studying New England. Enlist the aid of friends. Get them to take groups of pupils on field trips and on visits to factories. Some geologist can help you to find local illustrations of the surface features named in the text. Search for the reasons for past changes and present characteristics. What has determined the location of roads and railways, and the distribution of population? Make large maps showing these features. Talk with older townsfolk, read local histories, and tell your classmates what you find about the settlement of the town and its industrial and social development. What should be done to improve your town and ensure its prosperity?

COLLECTIONS. — Help to make careful and detailed collections for the school to illustrate each important industry of your town. Show the raw materials used, the steps in manufacture, and the finished products. Cut from trade journals pictures of the machinery used, and place these with the specimens. Place the best description of the industry and its processes, written by any member of the class, permanently with the specimens. Arrange exchanges with other schools, and thus secure collections illustrating all important New England industries. Carefully arrange the collections in cabinets or boxes so that they will be preserved, and that they may be easily presented for study. Collections of New England minerals and woods with related pictures are valuable. Secure from townspeople for a few days a loan collection to illustrate life and industries a century ago.

PICTURES. — Make a collection of photographs of home scenery, and make notes beside them regarding the surface features shown and their relation to life. Secure photographs of local industries. Collect pictures of New England scenery and life, and arrange them so as to illustrate the different topics studied. Compare the pictures with maps of the same places. Good pictures are contained in the booklets of the Boston and Maine, Bangor and Aroostook, and Central Vermont railways. These are given away.

MAPS. — The three southern New England States, and parts of the others, have been carefully mapped by the United States Geological Survey. For $2.00 the Director of the Survey will send from Washington one hundred assorted map sheets, which could include enough maps of the home town to give one to each pupil, and in addition others of other sections. Single sheets cost five cents. Suggestions

as to the use of these maps in elementary schools were prepared by Professor W. M. Davis, and were published by the Boards of Education of Massachusetts and Connecticut.

A school near the coast should obtain from the United States Coast and Geodetic Survey, Washington, D.C., a chart of the neighboring coast waters, and study the coast forms and their effect on industries and population. Cancelled charts of some waters, excellent for school use, may be obtained, without cost, through the member of Congress for the district in which the school is placed.

BOOKS. — Ask the librarian to place on the reference shelves of your public library, books on the geography, history, industries, and life of New England, which will both help and interest you. The *New England Magazine* has described and illustrated the history and industries of many cities and towns. Ask the representative to the state legislature from your district to secure for the school copies of the reports of the Commissioner of Industrial Statistics and other state documents. Send to the Secretary of Agriculture, Washington, D.C., for a list of the publications of the Agricultural Department. Some of the Farmers' Bulletins tell about New England farming, and will be sent free. Secure from the state superintendent of schools, or from the last report of the United States Commissioner of Education, a list of the colleges and other higher schools of the state, and make a map showing their distribution. Send for catalogues of these schools for your school library. Which school would you prefer to attend?

Read "Good Old Times," by Elijah Kellogg, as a picture of frontier life in colonial New England. His Elm Island stories tell of early life on the coast of Maine. Read R. H. Dana's "Two Years Before the Mast." For the best pictures of New England child life in the last century, read C. D. Warner's "Being a Boy"; T. B. Aldrich's "Story of a Bad Boy"; "A New England Girlhood," by Lucy Larcom; and "A New England Boyhood" by E. E. Hale. A good account of the development of industries is given in "American Inventors and Inventions," a book written for schools by W. A. Mowry.

WRITTEN WORK. — (1) If you live in the city, write an account of a vacation in the country or at the seashore. If you live in the country, tell of a visit to the city, or about the summer visitors to your town. (2) Perhaps your teacher, through the superintendent, will arrange for the school to exchange letters with children living in different surroundings elsewhere in the state, the letters describing the home life and work of the writers. (3) Tell how the roads of your town or city are made or mended. Which are best, and why?

(4) Write a report of an address given the class, by some business man of the town, concerning the industry with which he is related.

SPECIAL ASSIGNMENTS. — Make a study of some topic in New England history assigned by your teacher, and report on it to the class. For instance, — early explorers; the settlement of New Hampshire; the Pequot War; British attacks on the New England coast during the Revolution; slavery in New England; Ethan Allen; the Ashburton Treaty, etc. (2) Similarly study some topic in local government assigned you, by consulting the town or city officers and your friends. (3) Make a study of some home industry assigned you. Discover what favored its establishment and growth. Describe its methods through the year; its tools and machinery; the raw materials; the products; and the related trade or commerce.

TOPICAL STUDY OF A STATE. — These topics may be used as the basis for a final review, or as a guide for more extended study.

I. *Physiography.* — (1) Position: state and show by drawings; advantages; boundaries, their history and causes. (2) Form: describe and draw. (3) Size: square miles, compared with states and countries; illustrative diagrams and maps. (4) Relief: character; history; effects on life; glacial forms; their distribution, formation, effects; sections of state. (5) Drainage: maps of the main divides; the larger river basins; the rivers; lakes and waterfalls, — character, cause, effects; uses of rivers and lakes. (6) Climate: temperature; winds; rainfall; seasonal changes; effects on industries; effects on people.

II. *Natural Resources.* — (1) Minerals: kinds; distribution; importance. (2) Forests: past and present distribution; value; preservation.

III. *People.* — (1) Settlement: history; character of settlers; character of later immigrants; causes and effects. (2) Population: past and present; rate of growth; distribution; changes in country and city. (3) Education: development of public schools; higher schools in the state; libraries. (4) Government: state constitution; its nature; state officers; duties; election. City and town governments.

IV. *Industries.* — (1) Development: pioneer conditions; early commerce; rise of manufacturing; means of communication. (2) List of industries. For every one, — its cause, development, location, importance; the raw materials, processes, and products; the sale of products.

V. *Cities and Towns.* — (1) Map. (2) Position, size, cause of location and growth, industries, characteristics, historic interest.

VI. *Review by Physiographic Sections.* — Their natural advantages, industries, and the character and distribution of the population.

APPENDIX

POPULATION OF THE NEW ENGLAND STATES: 1790 to 1900

POPULATION

Census Years.	Mass.	R.I.	Conn.	N.H.	Maine.	Vt.
1790 . . .	378,787	68,825	237,946	141,885	96,540	85,425
1800 . . .	422,845	69,122	251,002	183,858	151,719	154,465
1810 . . .	472,040	76,931	261,942	214,460	228,705	217,895
1820 . . .	523,159	83,015	275,148	244,022	298,269	235,966
1830 . . .	610,408	97,199	297,675	269,328	399,455	280,652
1840 . . .	737,699	108,830	309,978	284,574	501,793	291,948
1850 . . .	994,514	147,545	370,792	317,976	583,169	314,120
1860 . . .	1,231,066	174,620	460,147	326,073	628,279	315,098
1870 . . .	1,457,351	217,353	537,454	318,300	626,915	330,551
1880 . . .	1,783,085	276,531	622,700	346,991	648,936	332,286
1890 . . .	2,238,943	345,506	746,258	376,530	661,086	332,422
1900 . . .	2,805,346	428,556	908,355	411,588	694,466	343,641

PERCENTAGE OF INCREASE

Census Years.	Mass.	R.I.	Conn.	N.H.	Maine.	Vt.
1800 . . .	11.6	0.4	5.4	29.5	57.2	80.8
1810 . . .	11.6	11.3	4.3	16.6	50.7	41.
1820 . . .	10.8	7.9	5.	13.7	30.4	8.2
1830 . . .	16.6	17.1	8.1	10.3	33.9	18.9
1840 . . .	20.8	12.	4.1	5.6	25.6	4.
1850 . . .	34.8	35.6	19.6	11.7	16.2	7.5

Census Years.	Mass.	R.I.	Conn.	N.H.	Maine.	Vt.
1860 . . .	23.7	18.4	24.	2.5	7.7	0.3
1870 . . .	18.3	24.5	16.8	—	—	4.9
1880 . . .	22.3	27.2	15.8	9.	3.5	0.5
1890 . . .	25.5	24.9	19.8	8.5	1.9	—
1900 . . .	25.2	24.	21.7	9.3	5.	3.3

Questions. — (1) Which state had the smallest population for many years? Which has now the fewest inhabitants? Explain this (pp. 77 and 98). (2) Which states had the greatest percentage of increase in population at first? Which after the middle of the last century? Explain this (pp. 19 and 22). (3) What portion of the total population was in Massachusetts in 1790? In 1900? Why the difference (p. 67)?

GROWTH IN POPULATION OF THE LARGEST CITIES.

	1900	1880	1860	1840	1820	1800
Boston . . .	560,892	362,839	177,840	93,383	43,298	24,937
Providence . .	175,597	104,857	50,666	23,171	11,767	7,614
Worcester . .	118,421	58,291	24,960	7,497	2,962	2,411
New Haven . .	108,027	62,882	39,267	12,960	7,147	4,049
Fall River . .	104,863	48,961	14,026	6,738	1,594	—
Lowell . . .	94,969	59,475	36,827	20,796	—	—
Cambridge . .	91,886	52,669	26,060	8,409	3,295	2,453
Hartford . . .	79,850	42,015	29,152	9,468	4,726	5,347
Bridgeport . .	70,996	27,643	13,299	3,294	1,500	—
Lynn	68,513	38,274	19,083	9,367	4,515	2,837
Lawrence . .	62,559	39,151	17,639	—	—	—
New Bedford .	62,442	26,845	22,300	12,087	3,947	4,361
Springfield . .	62,059	33,340	15,199	10,985	3,914	2,312
Somerville . .	61,643	24,933	8,025	—	—	—
Manchester . .	56,987	32,630	20,107	3,235	761	—
Portland . . .	50,145	33,810	26,341	15,218	8,581	3,704
Salem	35,956	27,563	22,252	15,082	11,346	9,457

Questions. — (1) Salem is now the twenty-second city of New England in population. What was its rank in 1800? Why the difference

(p. 21)? (2) Compare the cities of coast and interior as to their growth. Review text on development of New England, and consider the reasons for the differences. (3) Contrast Boston and its suburbs, Cambridge and Somerville (p. 30). (4) Contrast Fall River and Lowell (pp. 52, 53); Hartford and Bridgeport; Portland and Manchester; New Bedford and Springfield. Find causes of differences.

POPULATION OF CITIES AND LARGE TOWNS, 1900.

CITIES OF MASSACHUSETTS	
Beverly	13,884
Boston	560,892
Brockton	40,063
Cambridge	91,886
Chelsea	34,072
Chicopee	19,167
Everett	24,336
Fall River	104,863
Fitchburg	31,531
Gloucester	26,121
Haverhill	37,175
Holyoke	45,712
Lawrence	62,559
Lowell	94,969
Lynn	68,513
Malden	33,664
Marlboro	13,609
Medford	18,244
Melrose	12,962
New Bedford	62,442
Newburyport	14,478
Newton	33,587
North Adams	24,200
Northampton	18,643
Pittsfield	21,766
Quincy	23,899
Salem	35,956
Somerville	61,643
Springfield	62,059
Taunton	31,036
Waltham	23,481
Woburn	14,254
Worcester	118,421

TOWNS — MASSACHUSETTS	
Abington	4,489
Adams	11,134
Amesbury	9,473
Amherst	5,028
Andover	6,813
Arlington	8,603
Athol	7,061
Attleboro	11,335
Barnstable	4,364
Belmont	3,929
Blackstone	5,721
Braintree	5,981
Brookline	19,935
Bridgewater	5,806
Canton	4,584
Chelmsford	3,984
Clinton	13,667
Concord	5,652
Dalton	3,014
Danvers	8,542
Dartmouth	3,669
Dedham	7,457
Easthampton	5,603
Easton	4,837
Falmouth	3,500
Framingham	11,302
Franklin	5,017
Gardner	10,813
Grafton	4,869
Great Barrington	5,854
Greenfield	7,927
Hingham	5,059
Hudson	5,454
Hyde Park	13,244
Ipswich	4,658
Lee	3,596
Lenox	2,942
Leominster	12,392
Lexington	3,831
Mansfield	4,006
Marblehead	7,582
Methuen	7,512
Middleboro	6,885
Milford	11,376

Millbury	4,460
Milton	6,578
Montague (Turner's Falls)	6,150
Natick	9,488
Needham	4,016
North Andover	4,243
North Attleboro	7,253
Northbridge	7,036
North Brookfield	4,587
Norwood	5,480
Orange	5,520
Palmer	7,801
Peabody	11,523
Pepperell	3,701
Plymouth	9,592
Provincetown	4,247
Randolph	3,993
Reading	4,969
Revere	10,395
Rockland	5,327
Rockport	4,592
Saugus	5,084
Southbridge	10,025
South Hadley	4,526
Spencer	7,627
Stoneham	6,197
Stoughton	5,442
Swampscott	4,548
Tewksbury	3,683
Wakefield	9,290
Ware	8,263
Watertown	9,706
Webster	8,804
Wellesley	5,072
Westboro	5,400
Westfield	12,310
West Springfield	7,105
Weymouth	11,324
Whitman	6,155
Williamstown	5,013
Winchendon	5,001
Winchester	7,248
Winthrop	6,058

CITIES OF RHODE ISLAND

Central Falls	18,167
Newport	22,034
Pawtucket	39,231
Providence	175,597
Woonsocket	28,204

TOWNS — RHODE ISLAND

Barrington	1,135
Bristol	6,901
Burrillville	6,317
Coventry	5,279
Cranston	13,343
Cumberland	8,925
East Providence	12,138
Jamestown	1,498
Johnston	4,305
Lincoln	8,937
Little Compton	1,132
North Kingstown	4,194
South Kingstown	4,972
Tiverton	2,977
Warren	5,108
Warwick	21,316
Westerly	7,541

TOWNS — CONNECTICUT

AND INCORPORATED CITIES AND BOROUGHS

Ansonia, city	12,681
Branford	5,706
Branford, borough	2,473
Bridgeport, city	70,996
Bristol	9,643
Bristol, borough	6,268
Danbury	19,474
Danbury, city	16,537
Derby, city	7,930
East Hartford	6,406
Enfield	6,699
Fairfield	4,489
Glastonbury	4,260
Greenwich	12,172
Greenwich, borough	2,420
Groton	5,962
Hamden	4,626
Hartford, city	79,850
Huntington	5,572
Shelton, borough	2,837
Killingly	6,835
Danielson, borough	2,823

Litchfield	3,214
Litchfield, borough	1,120
Manchester	10,601
Meriden	28,695
Meriden, city	24,296
Middletown	17,486
Middletown, city	9,589
Milford	3,783
Naugatuck, borough	10,541
New Britain	28,202
New Britain, city	25,998
New Haven, city	108,027
New London, city	17,548
New Milford	4,804
Norwalk	19,932
Norwalk, city	6,125
So. Norwalk, city	6,591
Norwich	24,637
Norwich, city	17,251
Orange	6,995
West Haven, borough	5,247
Plainfield	4,821
Portland	3,856
Putnam	7,348
Putnam, city	6,667
Seymour	3,541
Southington	5,890
Southington, borough	3,411
Stafford	4,297
Stafford Springs	2,460
Stamford	18,839
Stamford, city	15,997
Stonington	8,540
Stonington, borough	2,278
Stratford	3,657
Thompson	6,442
Torrington	12,453
Torrington, borough	8,360
Vernon	8,483
Rockville, city	7,287
Wallingford	9,001
Wallingford, borough	6,737
Waterbury	51,139
Waterbury, city	45,859
Westport	4,017
Winchester	7,763
Winsted, borough	6,804
Windham	10,137
Willimantic, city	8,937
Windsor	3,614

CITIES OF NEW HAMPSHIRE

Berlin	8,886
Concord	19,632
Dover	13,207
Franklin	5,846
Keene	9,165
Laconia	8,042
Manchester	56,987
Nashua	23,898
Portsmouth	10,637
Rochester	8,466
Somersworth	7,023

TOWNS — NEW HAMPSHIRE

Bethlehem	1,261
Claremont	6,498
Conway	3,154
Derry	3,583
Exeter	4,922
Farmington	2,265
Goffstown	2,528
Haverhill	3,414
Hillsboro	2,254
Lancaster	3,190
Lebanon	4,965
Lisbon	2,221
Littleton	4,066
Milford	3,739
Newmarket	2,892
Newport	3,126
Pembroke (Suncook)	3,183
Peterboro	2,527
Pittsfield	2,129
Plymouth	1,972
Salem	2,041
Walpole	2,693
Winchester	2,274
Wolfboro	2,390

CITIES OF MAINE

Auburn	12,951
Augusta	11,683
Bangor	21,850
Bath	10,477
Belfast	4,615
Biddeford	16,145
Brewer	4,835

Calais	7,655
Eastport	5,311
Ellsworth	4,297
Gardiner	5,501
Hallowell	2,714
Lewiston	23,761
Old Town	5,763
Portland	50,145
Rockland	8,150
Saco	6,122
South Portland	6,287
Waterville	9,477
Westbrook	7,283

TOWNS — MAINE

Berwick	2,280
Bridgton	2,868
Bristol	2,572
Brunswick	6,806
Bucksport	2,339
Camden	2,825
Caribou	4,758
Chelsea	3,092
Dexter	2,941
East Livermore	2,129
Eden (Bar Harbor)	4,379
Fairfield	3,878
Farmington	3,288
Fort Fairfield	4,181
Fort Kent	2,528
Freeport	2,339
Gorham	2,540
Hampden	2,182
Houlton	4,686
Jay	2,758
Jonesport	2,124
Kennebunk	3,228
Kennebunkport	2,123
Kittery	2,872
Lisbon	3,603
Lubec	3,005
Madison	2,764
Norway	2,902
Orono	3,257
Paris	3,225
Pittsfield	2,891
Presque Isle	3,804
Rockport	2,314
Rumford	3,770
St. George	2,206
Sanford	6,078
South Berwick	3,188
Skowhegan	5,180
Thomaston	2,688
Vinal Haven	2,358
Waldoboro	3,145
Winslow	2,277
Yarmouth	2,274
York	2,668

CITIES OF VERMONT

Barre	8,448
Burlington	18,640
Montpelier	6,266
Rutland	11,499
St. Albans	6,239
Vergennes	1,753

TOWNS — VERMONT

Barre	3,346
Barton	2,790
Bennington	8,033
Brandon	2,759
Brattleboro	6,640
Colchester (Winooski)	5,352
Derby	3,274
Essex	2,203
Fair Haven	2,999
Hardwick	2,466
Hartford	3,817
Lyndon	2,956
Middlebury	3,045
Morristown	2,583
Newbury	2,125
Newport	3,113
Northfield	2,855
Poultney	3,108
Proctor	2,136
Randolph	3,141
Rockingham (Bellows Falls)	5,809
Richford	2,421
St. Johnsbury	7,010
Springfield	3,432
Swanton	3,745
Waterbury	2,810
West Rutland	2,914
Woodstock	2,557